THE IRON TRADE REVIEW

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Cheering News of Continued Improvement

Recent Advances Maintained in Nearly all Centers— Large Orders for Steel Rails Expected at an Early Date

Cheering news comes from the leading iron centers, but with it there is an expression of the importance of conservatism. An official of one of the largest companies says that business has had a severe case of typhoid fever, is now convalescing and must be given a very restricted diet in the way of higher prices, or there will be a relapse. Recent advances are being well maintained for the most part in the central west, but in eastern territory are not strictly adhered to. Eastern mills have not enjoyed improvement in business to as great an extent as those in other sections, particularly the Pittsburgh district.

Steel Corporation bookings are still holding at somewhat better than 50,000 tons daily. The lease of the three furnaces of the Warwick Iron & Steel Co., Pottstown, Pa., by the Eastern Steel Co., Pottsville, Pa., which seems to be assured, is an important development in a steel plant making provision for its pig iron which has been purchased in the open market.

Railroad Buying

Rail business has been coming out rather slowly, but now leading manufacturers are confidently expecting that orders for 500,000 tons will be placed within 10 days. The B. & O. railroad has ordered 40,000 tons, of which the Carnegie Steel Co. was awarded 17,000, the Illinois Steel Co. 7,000, and the Pennsylvania Steel Co. a smaller tonnage. The Nickel Plate has ordered 4,000 tons of rails from the Illinois Steel Co. The Pennsylvania railroad is about to close on an inquiry for 17,000 freight cars and it is believed that its orders will, in time, call for a very much larger number. That car builders are busy is shown by the fact that it is necessary to wait several weeks for estimates on cars. Eastern railroads have placed a considerable tonnage of track fastenings and a fair amount of business in this line has been done in the Cleveland market.

Pig Iron

A fair amount of pig iron has been purchased during the past week and good inquiry is pending. The sale of 25,000 tons of Bessemer by the Ohio Iron & Steel Co. to the Youngstown Sheet & Tube Co. at $14.25, valley, for January and February delivery, was the largest sale of Bessemer since February, 1910, barring the recent exchange deal by the same seller and the Republic Iron & Steel Co. A Cleveland steel company took 2,000 tons of Bessemer. In the east, leading buyers covered for about 20,000 tons of various grades and are still inquiring for a considerable tonnage. The price of ferro-manganese has been advanced to $41, seaboard, by English makers. Before the advance was announced, sales amounting to about 8,000 tons were made.

Bars, Sheets and Plates

A leading manufacturer, Tuesday, sold 20,000 tons of bars and shapes at 1.15c and 1.20c, Pittsburgh, respectively. In the central west, bars are firmly held at 1.15c, up to April 1, and 1.20c, after that date. On plates, some concessions have been made in eastern territory, but elsewhere recent advances seem to be well maintained. In sheets, it is seldom possible to speak with absolute confidence on account of the large number of manufacturers and absence of co-operation. The market at the present time is undoubtedly much firmer than it was before the recent advances were made, but prices have not yet been fairly tested.

Structural Material

The Barr building, or Railway Exchange, St. Louis, calling for 10,000 tons, has been awarded to the Jones & Laughlin Steel Co. The Eagle loft, New York, 3,500 tons, will be erected by the Hay Foundry & Iron Works. Bethlehem sections will be used for the Eddystone extension of the Baldwin Locomotive Works, requiring about 3,500 tons. The McMyler Interstate Co., Cleveland, has been awarded 4,000 tons of steel for the new Washington, D. C., postoffice, for which John Gill & Sons, Cleveland, are the general contractors. Bids have been submitted on 40,000 tons for the Hell Gate bridge, New York.

Iron Ore

The shipments of iron ore by the United States Steel Corporation from the Lake Superior district during the year were slightly in excess of 17,000,000 tons, or about 53 per cent of the total shipments. This is an increase of about 3 per cent over last year, when the Corporation shipped slightly less than half of all the ore moved. Ore imports for the year are estimated at 1,800,000 tons, a decrease of 800,000 tons, compared with last year. The largest shipper from abroad was Cuba, which sent about 1,000,000 tons to the United States.

Coke and Scrap

Sales of prompt furnace coke have been made this week at $1.65, oven, the highest price of the year. There has been some scarcity of labor in the coke regions, but foreigners are now flocking back to this country. The scrap market is showing more signs of activity and there has been considerable speculative buying in Philadelphia.

WORLD'S IRON MARKETS

PITTSBURGH

Heavy Orders for Finished Material—Sale of Bessemer Pig.

Office of THE IRON TRADE REVIEW,
2148-49 Oliver Bldg., Dec. 19.

Orders for finished steel products entered on mill books so far this month exceed those of any corresponding period this year and practically all of the larger companies in the western Pennsylvania territory report that daily bookings since Dec. 1 have been greatly in excess of capacity, with the result that several of the larger mills have about all the business they can handle during the next 30 to 60 days. In semi-finished steel, shapes, plates, steel bars, sheets and wire products, orders are being placed at $1 to $2 a ton above the market level in November. It is expected that the flow of orders and mill operations will slow down somewhat during the holiday season, but liberal specifications have been received against contracts previously placed for January shipment and indications point to extremely heavy production during the initial month of the new year. As a result of the decided improvement in general market conditions, the mills are gradually getting back to the policy of quoting strictly on a Pittsburgh basis. In some branches of the trade, mills which had been idle for many months have resumed operations and prospects are that a number of plants now idle will be started early in the new year. The leading interest this week started its 25 tin mill plant at Monessen; placed its Sharon and New Castle, Pa., tin mills in full operation and started five additional mills at its American plant. The Carnegie Steel Co. this week is rolling sheet bars at the Edgar Thomson rail plant. Prices of crude steel are firmer and some mills are quoting 25 to 50 cents a ton higher than a week ago. Plates are firm at 1.15c, Pittsburgh, and one sale is reported at $1 a ton above this figure. The pig iron market is quiet but firm. Prices on several grades of old material have been advanced. Sales of prompt furnace coke have been made this week at $1.65, ovens, the highest price of the year. The previous high mark was $1.60, ovens, reached in March and again early in December.

The largest sale of Bessemer pig iron made since February, 1910, has just been consumated by the Ohio Iron & Steel Co., which sold 25,000 tons to the Youngstown Sheet & Tube Co. at $14.25 for January and February delivery. The last sale of anything like this size was to the United States Steel Corporation in February last year, it being 40,000 tons at $18, valley. In March of that year the Cambria Steel Co. took 10,000 tons at $17.50, valley, and in May and August the Republic Iron & Steel Co. bought 2,500 tons at $15.60, valley, and 2,000 tons at $15, valley, respectively. The $15 price remained unbroken until Oct. 3 this year when 1,000 tons were sold at $14.65, valley.

Pig Iron.—The first two Bessemer pig iron transactions of size in almost two years have given that market an importance for the moment that it has not had in a long time. The first chronologically was the sale of 2,000 tons at $14.25, valley, by a Mahoning valley furnace to a consumer at Cleveland. The second, which was finally concluded Monday, was the sale of 25,000 tons to the Youngstown Sheet & Tube Co. by the Ohio Iron & Steel Co. The price paid was $14.25, valley, the regular market price, and delivery is to be made in the first quarter. The seller some weeks ago exchanged about the same quantity of Bessemer to the Republic Iron & Steel Co. for 50,000 tons of ore. These two sales now establish the Bessemer market firmly at $14 25, valley.

Prices on most grades of pig iron are firm. Some furnaces, which booked moderately heavy business in November and the first of December, have advanced quotations on some grades, but low prices are still in evidence. The Westinghouse Machine Co. has entered the market for foundry iron for delivery over the first quarter and is expected to purchase a round tonnage. Investigation shows that trading in foundry grades has been heavier than previously reported. Three or four sales involving from 500 to 2,000 tons have been negotiated by nearby consumers. The market is firm at $13, valley, for No. 2, and some furnaces are quoting slightly higher prices, particularly for forward delivery. The Punx'y furnace, Punxsutawney, Pa., which was blown out late in December, 1910, was relighted a few days ago. There has been no trading of importance in basic. Two or three inquiries previously referred to are still pending. Some valley furnaces have quoted as high as $12.75, valley, on this grade, but some sellers recently quoted $12.35, valley, and we continue to quote the market at this figure. There has been moderate buying of gray forge iron at $12.50 to $12.75, valley. We quote the market as follows:

(Prompt Shipment.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	12.35
Basic, Pittsburgh	13.25
No. 2 foundry, Pittsburgh	13.90
Gray forge, Pittsburgh	13.40
Malleable, Pittsburgh	13.65

(First Quarter.)

Bessemer, valley	$14.25
Bessemer, Pittsburgh	15.15
Basic, valley	12.50
Basic, Pittsburgh	13.40
No. 2 foundry, Pittsburgh	13.90
Gray forge, Pittsburgh	13.65
Malleable, Pittsburgh	13.65

Sheets.—Several contracts for sheets involving moderately heavy tonnage for early shipment have been placed in this market since prices were advanced from $1 to $2 a ton several days ago and all mills apparently are observing the higher quotations, the market now being quotable at 1.40c, for blue annealed sheets No. 10 gage; 1.90c, for black sheets, No. 28 gage, and 2.90c, for galvanized sheets No. 28 gage, all f. o. b. Pittsburgh. Mill orders for sheets at present are heavy, some companies reporting heavier tonnage than for a long time. As a result of the increased demand, additional mills have been started and present indications are that there will be a material increase in mill activities about the first of the year. Preliminary reports made by some companies show that the production of sheets this year will be about equal to that of 1910, which was considered a normal year in this branch of the trade. We quote the market as

follows, with $1 a ton added as the delivered price in the Pittsburgh district:

Blue annealed sheets No. 10 gage, 1.40c; black annealed sheets No. 28 gage, 1.90c; galvanized sheets, No. 28 gage, 2.90c; painted roofing sheets, $1.35 per square for No. 28 gage, 2½-inch corrugation; galvanized roofing sheets, $2.45 to $2.50 per square for No. 28 gage, 2½-inch corrugation, f. o. b. Pittsburgh.

Tin Plate.—Tin mill operations this week are heavier than for some months and there will be a further increase in mill activities within the next few weeks. The American Sheet & Tin Plate Co. this week started its 25-mill plant at Monessen, Pa.; placed in service all of the idle mills at the New Castle and Sharon, Pa., plants, all of the 70 tin mills in these districts now being active, and also started four additional mills at its American plant. The Jones & Laughlin Steel Co. will place in service its new unit of 12 mills at Aliquippa, Pa., about the beginning of the year. Some of the independent companies are now operating in full, having received liberal specifications against contracts for first quarter shipment. It is stated that 90 per cent of the larger buyers of tin plate are covered for the first three months of next year. Official reports show that the tin plate production in 1911 will exceed that of any preceding year in the history of the trade, some companies having passed their previous high mark fully 30 days ago. We quote the market as follows:

Coke tin plate, 100-pound basis, 14 x 20, $3.40 f. o. b. mill, Pittsburgh district.

Rails and Track Material.—The rail market is very quiet. No important contracts have been placed during the past week and formal inquiries for 1912 rails have not been received from the larger trunk lines. It is believed in some quarters that some of the larger inquiries referred to recently will not be acted upon until the first of the year. There is a fair demand for railroad spikes. The market is quoted as follows, the base price on open-hearth steel rails being 1.34c per pound at the mill:

Fifty-pound and heavier, 1.25c per pound; carloads apd less than 500 tons, 1.34c per pound; light rails on base weight of 40 to 45 pounds, 1.16c, the schedule on the other weights being irregular and subject to negotiations; angle splice bars for standard sections, 1.50c, Pittsburgh; track bolts, 2.20c to 2.25c, Pittsburgh.

Railroad Spikes.

4½, 5 and 5½ and 9/16	$1.40
3, 3½, 4, 4½ and 5 x ½	.10
3½, 4 and 4½ x 7/16	.20
3, 3½, 4 and 4½ x ⅜	.30
2½ x ⅜	.40
2½, 3 and 3½ x 7/16	.60
2 x 7/16	.80

Steel.—The semi-finished steel market is showing more activity than for some time and practically all mills are asking higher prices. Three or four of the larger companies report that mill orders so far this month exceed those of any corresponding period this year, although it is not expected that the December total will exceed that of last March, the banner month of the year, as the trade expects a slight let-up during the remainder of the month on account of the holidays and inventory period. Liberal specifications have been received for shipment in January and present indications are that production in that month will be extremely heavy. On Bessemer and open-hearth billets, $19.50, Pittsburgh or Youngstown, represents the market level, although some mills are quoting 50 cents a ton higher. On Bessemer and open-hearth sheet bars some mills are quoting $21, Pittsburgh or Youngstown, as the minimum, although this price has been shaded 50 cents a ton. The market on forging billets is firmer and local mills are now quoting $25, Pittsburgh, an advance of $1 a ton. Quotations on billets and sheet bars follow:

Bessemer 4 x 4 billets with 0.25 carbon and less are quoted at $19.50, with the usual extras for size and analysis, and open-hearth rolling billets, $19.50, Bessemer sheet and tin bars are quoted at $20.50 to $21, and open-hearth sheet bars are quoted at $20.50, f. o. b. Pittsburgh or Youngstown, with full freight to destination added. Forging billets are quoted at $25, Pittsburgh.

Hoops and Bands.—New demand for hoops and bands shows some improvement and prices are firm. We quote the market as follows:

Hoops in carload lots, 1.30c, Pittsburgh; in less than carload lots, 1.40c; bands, 1.15c to 1.20c, base, with net extras, as per standard steel.

Merchant Bars.—As a result of the heavy orders for steel bars placed during the past 30 days, some mills have about all the business they can handle for delivery over the next few months and the statement is made that one or two companies in this section are oversold for first quarter shipment. The market is firm at 1.15c, Pittsburgh, and some mills have quoted 1.20c, Pittsburgh, on inquiries for first half shipment. Demand for bar iron also shows some improvement and prices are firm. Some mills have withdrawn low quotations previously made on shafting, as a result of the increase in new orders and specifications. We quote the market as follows:

Common iron bars, 1.25c to 1.30c, Pittsburgh; Bessemer and open-hearth steel bars, 1.15c to 1.20c; plow and cultivator, 1.25c; channels, angles, zees, tees, under 3 inch, 1.25c, all f. o. b. mill. The following differentials are maintained on steel: Less than 2,000 pounds of a size, 0.35 advance. Cold rolled and ground shafting, 65 per cent off in carloads and 60 and 10 per cent in less than carloads, delivered in base territory.

Muck Bar.—Demand for muck bar shows a slight improvement. Prices are fairly firm. We quote muck bar at $27.50 to $28, Pittsburgh.

Structural.—As a result of the numerous structural awards made both east and west of Pittsburgh during the past month, local mills are running on a very satisfactory schedule and have considerable business on their books for forward delivery. In the immediate Pittsburgh territory, awards have been chiefly for small lots. Several proposed building projects are being figured upon which will require moderately heavy tonnage of steel, although no contracts are expected for some months. The Jones & Laughlin Steel Co. has received a contract for the Barr building, St. Louis, involving in the neighborhood of 10,000 tons. The McClintic-Marshall Construction Co. has a contract for an extension to the American Car & Foundry Co.'s plant at Chicago, involving 500 tons of steel; also 3,400 tons for the New York Central railroad work in New York. We quote the market as follows:

Beams and channels, 15 inches and under, zees, 1.15c to 1.20c; tees, 1.15c to 1.20c; angles, from 3 to 6 inches, 1.15c to 1.20c; over 6 inches, 1.25c; universal and sheared 1.15c to 1.20c; over 15 inches, 1.25c to 1.30c, plates, 6¼ inches wide and wider, 1.25c.

Ferro-Alloys.—Local dealers in ferro-manganese have withdrawn the quotation of $38.50, seaboard, and English makers have announced a new price of $41, Baltimore. Three or four sales involving from 100 to 500 tons each were made in this market during the week. The Carnegie Steel Co. will put one of the Isabella furnaces on ferro-manganese, but there is no foundation for the report that the company will enter the market as a seller of this material. No action has been taken on inquiries for 50 per cent ferro-silicon previously noted.

We quote ferro-manganese nominally at $38.50 Baltimore, for prompt and forward delivery. The freight rate from Baltimore to Pittsburgh is $1.95 per ton.

Fifty per cent ferro-silicon is quoted at $70, Pittsburgh, for prompt and forward delivery; 12 per cent, $22.50 to $23; 11 per cent, $21.50 to $22; 10 per cent, $20.50 to $21, f. o. b. Globe, Jisco and Ashland furnaces. The freight rate to Pittsburgh is $1.90. The foreign grades are held at $1 or more a ton over domestic prices.

Plates.—Mill orders for plates so far this month have been extremely heavy and a large volume of business

has been booked for forward delivery. Three or four of the large companies report daily bookings this month greatly in excess of capacity. All mills are now quoting 1.15c, Pittsburgh, as the absolute minimum, and one sale involving moderately heavy tonnage, about 2,000 tons, for nearby delivery, is reported at 1.20c, Pittsburgh. Mills are quoting according to their needs and 1.15c, Pittsburgh, can still be done. No car awards of importance were placed in this market during the week, but a large number of cars are being figured upon and additional awards are expected before the close of the year. We quote the market as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches, 1.15c to 1.20c. Extras are as follows, per 100 pounds: Boiler and flange steel plates, 0.10c; A. B. M. and ordinary firebox steel plates, 0.20c; still bottom steel, 0.30c; marine steel, 0.40c; locomotive firebox steel, 0.50c; all sketches excepting straight taper plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches, 0.10c; circles, 0.20c. Plates in widths over 100 inches up to 110 inches, 0.05c; over 110 inches up to 115 inches, 0.10c; over 115 inches up to 120 inches, 0.15c; over 120 inches up to 125 inches, 0.25c; over 125 inches up to 130 inches, 0.50c; over 130 inches, 1c. Gages under ½ inch to and including ⁵⁄₁₆-inch plate on thin edge, 0.10c; under ⁵⁄₁₆ and including No. 9, 0.25c. Five cents extra for less than carloads. Terms net cash in 30 days.

Merchant Pipe.—Bids have gone in on 140 miles of 12-inch pipe for western shipment and moderately heavy tonnage of large size pipe to be shipped to Canada. There has also been a fair run of small orders for line pipe. On account of the low prices ruling in this market and the improvement shown in the finished steel trade during the past 30 days, it is reported that prices on merchant iron and steel pipe will be advanced about the first of the year. Mills have issued a new card on oil country goods, prices on some sizes being advanced, while reductions on other sizes are noted. We quote the following official discounts in carload lots, subject to the usual preferential discount to the larger buyers, merchant pipe, where specified, being offered in from ⅛ to 6 inches:

Iron and Steel Pipe Basing Prices.

	Steel.		Iron.	
	Butt weld.			
	Black.	Galv.	Black.	Galv.
⅛, ¼ inch	74	54	68	48
⅜ inch	75	65	69	59
½ inch	78	68	72	62
¾ to 1½ inch.....	81	73	75	67
2 to 3 inches.....	82	75	76	69
	Lap weld.			
2 inches	79	72	72	65
2½ to 4 inches.....	81	72	74	67
4½ to 6 inches....	80	72	73	65
7 to 12 inches.....	77	68	71	61
13 to 15 inches.....	55	..	47	..
Extra Strong, Plain Ends.				
			Butt weld.	
⅛, ¼, ⅜ inch.....	70	60	65	55
½ inch	75	69	70	64
¾ to 1½ inch.....	79	73	74	68
2 to 3 inches	80	74	75	69
Extra Strong, Plain Ends.				
			Lap weld.	
2 inches	76	70	71	65
2½ to 4 inches.....	81	74	74	67
4½ to 6 inches.....	77	71	72	66
7 to 8 inches.....	70	60	65	55
9 to 12 inches.....	65	55	60	50
Double Extra Strong, Plain Ends.				
			Butt weld.	
½ inch	65	59	60	54
¾ to 1½ inch.....	68	62	63	57
2 to 3 inches	70	64	65	59
Double Extra Strong, Plain Ends.				
			Lap weld.	
2 inches	66	60	61	55
2½ to 4 inches.....	68	62	63	57
4½ to 6 inches.....	67	61	62	56
7 to 8 inches.....	60	50	55	45

Plugged and reamed pipe is furnished at 2 points higher price, either butt or lap weld.

Boiler Tubes.—Demand for merchant and locomotive boiler tubes shows further improvement in the way of new business and specifications, but prices continue irregular. Official discounts on steel and charcoal iron boiler tubes in carload lots follow:

Steel:

1¾ to 2¼ inch.....	65
2½ inch	67½
2¾ to 3¼ inch.....	72
3½ to 4½ inch.....	75
5 and 6 inch.....	67½
7 to 13 inch.....	65

Charcoal Iron:

1½ inch	48
1¾ to 2¼ inch.....	50
2½ inch	55
2¾ to 5 inch.....	60

To destination east of Mississippi river will be sold at delivered discount for carloads lowered by 2 points, for lengths 22 feet and under; longer lengths, f. o. b. Pittsburgh. Usual extras to jobbers and boiler manufacturers.

Wire Products.—All mills are observing the higher quotations on wire products, which became effective Dec. 11, and another advance of $1 a ton about Jan. 1 would not be unexpected. New business shows some improvement, although still below the capacity of the mills. We quote the market as follows:

Wire nails, jobbers, carload lots, $1.55; retailers' carload lots, $1.60; cut nails (western makers), jobbers' carload lots, $1.50; painted barb wire, jobbers' carload lots, $1.55; retailers' carload lots, $1.60 with 30c for galvanizing; plain wire to jobbers in carloads, $1.35; and to dealers, in carloads, $1.40; polished staples, $1.55; galvanized staples, $1.85.

Wire Rods.—Demand for wire rods is slightly better, but all mills could handle more tonnage. We quote Bessemer and open-hearth wire rods nominally at $25, Pittsburgh.

Coke.—Prompt furnace coke has been sold in this market during the last week at $1.65, ovens. This is the highest price at which prompt furnace coke has been sold this year. The previous high mark was $1.60, ovens, at which sales were made during the last three weeks in March and early in December. One consumer closed for about 1,000 tons at $1.65 ovens. Other sales involve about 130 cars, the greater portion having been placed at the higher figure. A fair amount of furnace coke is being figured upon for delivery over 1912, but sellers are asking higher prices and for this reason some deals are being held up temporarily. Several fairly large contracts for foundry coke have been placed for first half shipment. Production last week showed a gain of 3,199 tons and shipments showed a gain of 67 cars. We quote standard Connellsville furnace coke for prompt shipment at $1.60 to $1.65, ovens, and $1.65 to $1.75, ovens, for forward delivery. On high grade Connellsville foundry coke, we quote from $1.90 to $2, ovens, for prompt shipment, and from $2 to $2.25, ovens, for forward delivery. The Connellsville Courier's figures for the week ending Dec. 9, show 26,014 active ovens with an output of 319,130 tons, compared with 26,172 active ovens and a production of 315,931 tons the previous week.

Old Material.—Quotations on several grades of scrap have been advanced and the market as a whole is firmer, but there is not a great deal of trading at present. Some of the larger buyers of bundled sheet scrap are arranging for first quarter requirements and prices on this grade have been advanced 50 cents a ton, the minimum price now being $10.50, Pittsburgh. We also note an advance of 50 cents a ton on malleable and old iron rails, while prices on No. 1 wrought scrap, machine shop turnings and cast borings have been advanced 25 cents a ton. The embargo against shipments of heavy melting steel to Monessen is still in effect. We quote, gross tons, delivered in the Pittsburgh district, including Monessen, Sharon, Steubenville, Brackenridge and Follansbee, as follows:

Heavy melting scrap.....	$12.25 to 12.75
Rerolling rails	12.75 to 13.00
Malleable	12.00 to 12.50
Bundled sheet scrap.....	10.50 to 11.00
Iron axles	20.00 to 21.00
Old iron rails.....	15.00 to 15.50
Stove plate	9.00 to 9.50
No. 1 wrought scrap.....	12.50 to 13.00
Old car wheels.....	12.50 to 13.00
Low phosphorus	14.50 to 15.00
Machine shop turnings.....	9.25 to 9.75
Cast borings	8.75 to 9.25
No. 1 cast scrap	12.50 to 12.75

The proceedings of the congress of technology, held in Boston last April at the Massachusetts Institute of Technology, have been published in a 500-page volume, entitled, "Technology and Industrial Efficiency." Some 70 papers are included.

CHICAGO

Heavy Buying of Malleable Foundries —Conditions Improve.

Office of THE IRON TRADE REVIEW,
1328 Monadnock Block, Dec. 19.

December orders for finished materials in the Chicago market are expected to show a heavy increase compared with November, which was the most active month in the year. The comparatively heavy buying of the past few weeks is gradually having its effect on prices, which are slowly hardening. In this market, steel bars and plates are especially strong. A number of bar contracts have been executed recently in which the price is fixed at 1.28c, Chicago, for first quarter and 1.33c for second quarter delivery. Buyers seem generally willing to contract for the full year at present prices, but the mills are accepting no business for delivery beyond July 1, 1912. As the market grows firmer, the mills in this district are more inclined to consider the Pittsburgh basing point. The structural market is still quite independent, however, and eastern prices are not given very much consideration in fixing local quotations; beams and channels may be obtained at 1.30c, Chicago. In addition to large orders from car builders, western plate mills are commencing to receive very satisfactory tonnages from general sources.

Pig Iron.—The past week has been characterized by heavy buying on the part of malleable foundries. These interests have recently booked comfortable orders for car specialties and have entered the pig iron market to cover the contracts which they have on hand. The point has not yet been reached where malleable or steel foundries are willing to buy, unless they have orders actually in hand for which the iron will be needed. The buying movement in southern iron seems to have spent most of its strength for the time being; inquiry is much lighter and sales are noticeably less. Quite a number of southern furnaces represented in this market have for the present sufficient orders on their books for 1912 shipment, and have withdrawn their quotations. As a result the price is comparatively firm and in some cases $14.60, Chicago, is being done for first quarter delivery. A Michigan City, Ind., car builder is inquiring for from 2,000 to 3,000 tons of northern foundry iron. The Thomas furnace at Milwaukee has blown in after an idleness of many months.

The following prices represent the market for Chicago delivery, except northern No. 2, foundry and malleable Bessemer, made in local furnaces, which are quoted f. o. b. furnace:

	Shipments. First quarter.	First half.
Lake Superior charcoal	$16.50	$16.50
Northern fdy. No. 2	14.00	14.00
Southern fdy. No. 2	14.35	14.60
Southern silv'r's., 5 per cent silicon	15.60	15.60
Jackson Co. silv'r's., 8 per cent	17.40	17.40
Malleable Bessemer	14.00	14.00
Alabama basic	14.35	14.35

Billets.—Some contracts for forging billets have been closed and for delivery throughout the entire first half makers are asking a slight advance in price. The market is moderately active. We quote, open-hearth forging billets, $26, Chicago; re-rolling billets, $22.50.

Merchant Bars.—There has been no special change in the situation surrounding the bar iron market, although tonnage is improving and makers are somewhat more encouraged. Specifications and contracts for steel bars remain heavy and prices have advanced. The general run of business, including immediate shipment and first quarter contracts, is being placed at 1.28c, Chicago, which indicates that as the market grows firmer, the western mills are more inclined to consider the Pittsburgh basing point. Several makers which have been quoting very low prices, are also obtaining an extra dollar per ton for shipment throughout the second quarter. We note a contract for 1,500 tons of steel bars made recently, of which 500 tons will be shipped during the first quarter at 1.28c, Chicago, and 1,000 tons during the second quarter at 1.33c, Chicago. Hoops are firm at 1.48c, although on the more desirable orders it is believed the mills will shade 1.30c, Pittsburgh. The demand for shafting is decidedly better and prices are firmer.

We quote, Chicago delivery, as follows:

Bar iron, 1.12c to 1.18c; hard steel bars, rerolled, 1.15c to 1.20c; soft steel bars and bands and small shapes, 1.28c to 1.33c, base; hoops, 1.48c; smooth finished machinery steel, 1 inch and larger, 1.78c. Shafting 60 per cent off list for carload lots, 55 per cent off for less.

On iron and steel from local stock, we quote as follows:

Bar iron, 1.55c to 1.65c per pound base; soft steel bars, 1.55c to 1.65c per pound base; soft steel hoops, 1.80c to 1.90c, full extras.

Structural Material.—Although the structural mills are not as favorably situated as the plate mills with regard to tonnage, nevertheless heavy orders have been booked during this month and prices show considerable firmness. This market, however, is not adhering strictly to the Pittsburgh basing point and beams and channels may be obtained at 1.30c, Chicago. Fabricating contracts are encouraging and 11,897 tons will be required to cover those placed in the west last week. This includes 9,000 tons for the Barr building, St. Louis, which has been let to the Jones & Laughlin Steel Co. The American Bridge Co. has taken 700 to 800 tons respectively from Benjamin H. Marshall, Chicago, for two new apartment buildings, and has also taken 275 tons from the Great Northern Power Co., at Duluth, for transmission towers on a new line to be built between Thomson, Minn., and Superior, Wis. The St. Paul Foundry Co. has been awarded a contract covering 400 tons by Griggs-Cooper & Co., St. Paul. The McClintic-Marshall Construction Co. will fabricate an extension to the hammer shop of the American Car & Foundry Co., at Chicago, for which 497 tons will be required. The Crawford Locomotive & Car Co., Streator, Ill., has let a contract for a building, 225 tons, to the Decatur Bridge Co.

We quote, f. o. b. Chicago, as follows:

Beams and channels, 15 inches and under, 1.30c to 1.35c. For extras, see Pittsburgh report.

Plain material out of store is as follows:

All angles, 3 inches and larger, including 6 inches, $1.65 to $1.75 per 100 pounds; angles over 6 inches, $1.75 to $1.80 per 100 pounds, base; beams, 3 to 15 inches, inclusive, $1.65 per 100 pounds, base; channels, 3 inches and larger, $1.65 per 100 pounds, base.

Rails and Track Fastenings.—Although some very large rail tonnages are said to be under negotiation, nothing of consequence has been closed in the west recently. The Nashville, Chattanooga & St. Louis has ordered 10,000 tons of open-hearth rails from the Tennessee Coal, Iron & Railroad Co. The Northern Pacific and Great Northern are both negotiating for 40,000 tons each, but a definite settlement does not seem to be near. Business in track supplies is moderately good and prices show no change.

We quote, light rails, f. o. b. Chicago, and track fastenings, f. o. b. Joliet, as follows:

Light rails, carloads, 40 to 45-pound, 1.16c to 1.20½c; 30 to 35-pound, 1.19½c to 1.24c; 16, 20 and 25-pound, 1.20½c to 1.25c; 12-pound, 1.25c to 1.29½c.

Light section relayers, 45 pounds and under, subject to inspection, $21 to $23; standard section relaying rails, subject to inspection, $23.50 to $24.

Track fastenings, f. o. b. Joliet, angle bars, 1.50c; railroad spikes, 1.50c to 1.55c, smaller size spikes, 1.65c, base; track bolts with square nuts, 1.90c base.

Plates.—In addition to large orders

from car builders, western plate mills are commencing to receive very satisfactory tonnages from general sources. Practically all mills in this territory are now booked several months ahead and prices show considerable firmness. Although some eastern mills shipping into this territory are still accepting an occasional order of narrow plates at 1.25c, Chicago, the general level of the market is firm at 1.30c, and considerable business for immediate delivery is being obtained at 1.35c. Car buying continues, but on a more moderate scale. The Chicago, Rock Island & Pacific is in the market for 15 cabooses and the Chesapeake & Ohio is making inquiry for 200 freight cars. The Canadian Pacific has ordered 90 oil tank cars from the American Car & Foundry Co. and the same maker has taken 200 box cars from the Nashville, Chattanooga & St. Louis. The Harriman lines have ordered 65 all-steel combination baggage and postal cars from the Pullman Co. The Soo Line is in the market for 300 refrigerator and vegetable cars, and the Chicago, Burlington & Quincy has placed an order with the Crawford Locomotive & Car Co. for 500 steel center sills to reinforce old cars.

We quote, f. o. b. Chicago, as follows:

Tank plates, ¼ inch thick, 6¼ to 100 inches wide, 1.30c to 1.35c. For extras, see Pittsburgh report.

Store prices are as follows:

Tank steel, ¼ inch and heavier, up to 72 inches wide, 1.65c.

Sheets.—The sheet market has firmed up considerably, local mill prices on No. 28 black being 2.08c, which represents an advance in the immediate past of $1 a ton. No. 28 galvanized is held at 3.08c and No. 10 blue annealed at 1.58c. The mills in this territory are running full and makers have a fair amount of business on their books for future rolling.

We quote, store prices, f. o. b. Chicago, as follows:

Blue annealed, No. 10, 1.95c; No. 12, 2.05c. Box annealed, No. 28, 2.40c. Galvanized, No. 28, 3.35c.

For mill prices, see Pittsburgh report. Freight to Chicago, 18 cents.

Wire Products.—In carload lots to jobbers, wire nails are now selling at 1.73c, Chicago. The quotation on plain wire is 1.53c. Business is good and local mills are running at about 80 per cent capacity. Makers are confident of sustained improvement.

We quote, f. o. b. Chicago, as follows:

Wire nails, jobbers' carload lots, $1.73; retailers' carload lots, $1.83; retailers' less than carload lots, $1.93; painted barb wire, jobbers' carload lots, $1.73; retailers' carload lots, $1.83; retailers' less than carload lots, $1.93, with 30c for galvanizing; plain wire, jobbers' carload lots, $1.53; retailers' carload lots, $1.58.

Merchant Pipe and Tubes.—Jobbers have readjusted their prices on merchant pipe out of store, to conform with recent changes in mill quotations. Business does not seem to have been affected by the rearrangement in prices. Orders for tubes are fairly satisfactory and quotations are somewhat firmer.

We quote, iron and steel pipe and tubes, out of store, f. o. b. Chicago, as follows:

Merchant Pipe and Tubes.—Buying

IRON AND STEEL PIPE BASING PRICES.

	Steel. Black.	Steel. Galv.	Iron. Black.	Iron. Galv.
Butt.				
⅛ inch and ¼ inch.	71.2	50.2	63.2	42.2
⅜ inch	75.2	64.2	66.2	55.2
½ inch to 1½ inch.	78.2	69.2	71.2	62.2
Lap.				
2 inch	76.2	68.2	68.2	60.2
2½ inch to 6 inch..	77.2	68.2	69.2	60.2
Card Weight.				
7 inch to 12 inch...	74.2	63.2	67.2	56.2
Extra Strong Plain Ends.				
Butt.				
⅛, ¼, ⅜ inch	66.2	54.2	60.2	48.2
½ inch	71.2	59.2	65.2	53.2
2 inch to 3 inch...	76.2	64.2	....	....
Lap.				
2 inch	72.2	60.2	66.2	54.2
7 inch to 8 inch....	66.2	54.2	60.2	48.2
Double Extra Strong.				
Butt.				
½ inch	59.2	47.2	....	....
¾ inch to 1½ inch.	62.2	50.2	....	....
Lap.				
2 inch	60.2	48.2	....	....
2½ inch to 6 inch..	61.2	49.2	....	....
7 inch to 8 inch....	54.2	42.2	....	....

Tubes.

	Lap weld steel. Per cent.	Charcoal iron. Per cent.	Shelby seamless. Per cent.
1 inch	39	..	57½
1¼ to 2¼ inch	55	40	35
2¾ to 3¼ inch	65	50	46
3½ to 4½ inch	67½	50	46
5 to 6 inch	55	..	..

Cast Iron Pipe.—The demand for cast iron pipe at the present time is very limited. Municipal buying is practically at a standstill, most cities having arranged to get their pipe laid before the cold weather. Routine orders, however, are fairly satisfactory.

We quote, per net ton, Chicago, as follows:

Four-inch water pipe, $26.50; 6 to 12 inches, $24.50, larger sizes, $24; gas pipe, $1 a ton higher.

Old Material.—The local market has not displayed any special activity during the past week and conditions in the trade have not changed. The continued improvement in the steel business is encouraging dealers to buy for speculative profit and this has a certain stimulating effect on prices. Consumers, particularly mills rolling bar iron, are not entering the market unless they are offered particularly attractive quotations. As a consequence of these conditions, quotations show considerable variation and average values are difficult to determine.

We quote, for delivery in consumers' yards, Chicago, as follows:

GROSS TONS.

Old car wheels	$12.50 to 13.00
Old iron rails	14.50 to 15.00
Rerolling rails (5 ft. and over)	12.75 to 13.25
Old steel rails (3 ft. and under)	10.75 to 11.25
Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.00 to 10.50
Shoveling steel	9.25 to 9.75

NET TONS.

No. 1 R. R. wrought	$10.25 to 10.75
No. 2 R. R. wrought	9.25 to 9.75
Arch bars and transoms	13.50 to 14.00
Knuckles, couplers and springs	10.00 to 10.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.50 to 16.00
Locomotive tires	14.00 to 15.00
Dealers' forge	8.75 to 9.25
Pipe and flues	7.00 to 7.50
No. 1 cast	10.50 to 11.00
No. 1 busheling	8.00 to 8.50
No. 2 busheling	5.75 to 6.25
No. 1 boiler cut	7.00 to 7.50
Boiler punchings	12.50 to 13.00
Cast and mixed borings	5.00 to 5.50
Machine shop turnings	5.75 to 6.25
Railroad malleable	9.50 to 10.00
Agricultural malleable	9.25 to 9.75
Angle bars, splices, etc., iron	12.00 to 12.50
Angle bars, steel	9.00 to 9.50
Stove plate and light cast scrap	9.25 to 9.75

CLEVELAND

Steel Company Buys Bessemer. — Contract for Washington Postoffice.

Office of THE IRON TRADE REVIEW, Penton Bldg., Dec. 19.

Iron Ore.—The iron ore on Lake Erie docks Dec. 1, was 9,131,664 tons, which was 295,217 tons less than on that date last year. Shipments to furnaces between May 1 and Dec. 1, were 23,178,370 tons. This is a loss of 6,881,726 tons, compared with last year. As the total ore movement in 1911 declined 10,489,790 tons as compared with 1910, it is expected that the ore on docks May 1, will show considerable decrease compared with May 1, of this year, with furnace activity at about the present rate. Unfortunately no statistics of ore in furnace yards are available.

On base ores with the guarantee of 55 per cent on old range and Mesabi Bessemer, and 51½ per cent on old range and Mesabi non-Bessemer, we quote as follows: Old range Bessemer, $4.50; Mesabi Bessemer, $4.25; old range non-Bessemer, $3.70; Mesabi non-Bessemer, $3.50.

Pig Iron.—A Cleveland steel company has purchased 2,000 tons of Bessemer at $14.25, valley, for first

quarter. There is very fair inquiry for pig iron in lots ranging from 500 to 1,000 tons, foundry grades, and an inquiry for from 6,000 to 8,000 tons of basic for a Columbus melter for second quarter delivery is pending. Prices have not changed, but there is a tendency upward. We quote delivered in Cleveland, for the remainder of this year and the first half of next, as follows:

No. 1 foundry	$13.75
No. 2 foundry	13.25
No. 2 southern	14.35
Gray forge	12.50
Bessemer	15.15
Lake Superior charcoal	16.50
Jackson Co. 8 per cent silvery	17.05

Coke.—The coke market continues quiet with prices firm. We quote:

Connellsville furnace coke, $1.50 to $1.55 for prompt delivery, and $1.60 to $1.75 on contract; Connellsville foundry coke, $1.90 to $2 for prompt, and $2.15 to $2.40 on contract.

Finished Materials.—The prices in the finished material market are much firmer and general conditions are satisfactory. The advance of $1 a ton on wire products has resulted in heavier specifications against contracts, but very little new business is being done. Steel bars are absolutely firm at 1.15c, Pittsburgh, for delivery up to April 1, and 1.20c for delivery during the second quarter. Plates and shapes are quiet and prices are pretty well maintained. Sheet mills have, as a rule, filled up pretty well on low priced orders and there is much less eagerness for business than there was two or three weeks ago. No business is being taken at concessions of more than $1 a ton from the new high prices. Bids on the new city hall have been rejected and new bids will be called for. The McMyler Interstate Co. has taken a contract for 4,000 tons of structural material for the Washington, D. C., postoffice building, for which John Gill & Sons, Cleveland, are the general contractors. A number of railroads have placed orders for track fastenings and other business in this line is pending. There is also some inquiry for iron and steel bars from railroads, but the bar iron market is dull. An inquiry for 500 tons of reinforcing bars is pending.

Old Material — Further quietness has settled upon the local market, this being due to the fact that the larger consumers have covered fairly well into the first quarter, especially on heavy melting steel. The steel mills are taking material steadily that had been under contract, but the rolling mills are not buying. We quote, gross tons, f. o. b. Cleveland, as follows:

Old iron rails	$14.00 to 14.50
Old steel rails (under 6 ft.)	12.00 to 12.25
Old steel rails (over 6 ft.)	12.25 to 12.75
Relaying rails	20.00 to 21.00
Old car wheels	12.00 to 12.50
Old steel boiler plate	10.00 to 10.50
Malleable iron (railroad)	11.50 to 12.00
Steel axles	18.00 to 18.50
Axle turnings	8.50 to 9.50
Malleable iron (agricultural)	10.75 to 11.25
Heavy steel	11.00 to 11.50
Country mixed steel	9.50 to 10.00
Bundled sheet scrap	8.50 to 9.00

We quote, net tons, as follows:

No. 1 R. R. wrought	$11.00 to 11.50
No. 1 busheling	9.50 to 10.00
No. 1 machine cast	11.00 to 11.50
No. 1 dealers' wrought	10.00 to 10.50
Machine shop turnings	7.00 to 7.25
Pipes and flues	9.00 to 9.50
Wrought drillings	7.00 to 7.25
Stove plate	9.00 to 9.50
Cast borings	6.50 to 7.00
Wrought iron piling plate	15.50 to 16.00
Wrought iron arch bars	15.50 to 16.00

Numerous Sales of Moderate Tonnages of Pig Iron.

Office of THE IRON TRADE REVIEW,
808 Provident Bank Bldg., Dec. 18.

Pig Iron.—Sales ranging from 200 tons to 500 and more have been of rather frequent occurrence during the past week, and a number of inquiries for fair tonnage are yet pending. The tone of the market shows additional strength, from the sales point of view, although the matter of prices has not as yet been to any extent affected. Eastern and western districts have felt the results of the recent buying movement considerably more than has been experienced locally, where buying has not been as general in character as in the other sections of the country. Conditions present a much better aspect than is usual at the beginning of a presidential year, and selling agencies are greatly encouraged. The one feature of the situation that might be regarded as unsatisfactory is the fact that spot demand is very quiet, most of the inquiry coming from consumers not actually requiring iron today, but desiring to secure round lots for late delivery, which is presumed to have some of the elements of speculation in it. Southern furnaces appear to be holding to established quotations, and are not anxious to sell at less figure. It is very doubtful if any standard No. 2 could be obtained at a lower price than $10, Birmingham, although some analysis foundry iron is said to have been sold for 25 cents per ton less. Other producers are holding for $10.25 for first quarter and $10.50 for second, while yet others are practically out of the market for the present. Northern No. 2 is quotable at $13, Ironton, and a regular movement is reported. A northern Ohio melter wants 1,000 tons of malleable for first half delivery, and a concern in the southern part of the state is inquiring for 5,000 tons of northern foundry No. 2. A Michigan melter wants 1,600 tons of Virginia grades, same delivery. A couple of local melters bought southern foundry grades aggregating 1,000 tons. Sales of 1,500 tons to a southern Indiana, and 1,000 tons to a central Indiana melter, are reported. With freight rates from Birmingham $3.25, and from Ironton $1.20, we quote at Cincinnati as follows:

Southern foundry No. 2	$13.25
Southern foundry No. 3	13.00
Southern foundry No. 4	12.75
Southern gray forge	12.50
Mottled	12.50
Southern No. 1 soft	15.20
Southern No. 2 soft	14.70
Standard southern car wheel	25.50
Northern No. 2 foundry	14.20
Northern No. 3 foundry	13.70
Northern No. 4 foundry	13.20
Jackson county 8 per cent silicon	16.95

Coke.—One of the southern furnace companies is said to be figuring on its year supply, aggregating about 5,000 tons per month. Other inquiries for furnace brands are also pending, and some sales have been closed. Foundry demand is fair, with prevailing prices showing more firmness. Shipments on contract are said to be heavy, particularly for foundry brands. We quote from the leading coke-producing districts as follows:

	Prompt shipment.	Contract second half.
Connellsville district:		
Foundry coke	$2.00 to 2.25	$2.00 to 2.40
Furnace coke	1.55 to 1.65	1.75 to 1.90
Wise county district:		
Foundry coke	2.00 to 2.25	2.00 to 2.25
Furnace coke	1.75 to 2.00	*Sliding scale basis.
Pocahontas district:		
Foundry coke	2.00 to 2.10	2.00 to 2.10
Furnace coke	1.50 to 1.75	1.60 to 1.75
New river:		
Foundry coke	2.50 to 3.15	2.60 to 3.25
Furnace coke	2.10 to 2.15	2.10 to 2.20

*Sliding scale basis means $1.60 for coke based on $9, Birmingham, for pig iron, with an advance of 16⅔ per cent of the amount over $9 at which pig iron is quoted. This is the usual basis. Other forms of sliding contracts are also made.

Finished Material.—Steel bars are said to be reasonably firm on a 1.15c, Pittsburgh, basis, although it looks as though 1.10c is being done. Demand continues fairly active, in certain sections, but the local market is quiet, and without special feature.

Old Material.—Offerings indicate some increase the past week, and dealers are piling some iron. Shipments are said to be a little better, and it looks as though prices were a degree firmer. However, there is some fluctuation and it is difficult to obtain exact quotations. Dealers say they are about as follows:

GROSS TONS.

Old iron rails	$12.00 to 13.00
Old steel rerolling	11.00 to 11.50
Old iron axles	18.00 to 18.50

Steel melting scrap	9.50 to 10.50
Car wheels	10.50 to 11.00

NET TONS.

Old No. 1 R. R. wrought	$10.50 to 11.50
No. 1 machinery	10.00 to 10.50
No. 1 busheling	8.00 to 9.00
Stove plate	6.50 to 7.00
Machine shop turnings	5.50 to 6.00
Cast borings	4.50 to 5.00
Grate bars	6.00 to 7.00
Sheet iron bundled	6.50 to 7.50
No. 1 cast scrap	10.00 to 10.50
Heavy turnings	6.00 to 7.00

Hickman, Williams & Co. have been appointed exclusive sales agents for the United States of the Fairview Fluor Spar & Lead Co., of Fairview, Ill.

PHILADELPHIA

Low Finished Prices Not Yet Disappeared—Scrap is Bullish.

Dec. 18.

Announcements are being freely put out of advanced price schedules adopted by leading makers in various finished lines, but it is sharply evident that the higher levels are not being strictly followed as yet in eastern territory. Attractive contracts have still been able to bring out very low quotations. Improvement with eastern mills is still lacking. Pig iron is quieter with the approach of the holidays. Scrap is bullish and nervous. Some fair sales have resulted.

Pig Iron.—A deal in the final stage of negotiation for the long term leasing of the blast furnaces of a leading Schuylkill valley interest by an eastern steel company is of considerable importance from a market standpoint as affecting the alignment of large buyers and sellers in this territory. The market is drifting into the state of quietness that usually prevails at the holiday season. Buying has moderated and individual sales are smaller. Some sellers report good bookings, but these have usually been made in outside districts such as New England. Some irregularity still characterizes the price situation. A Philadelphia melter is reported to have taken 1,000 tons of No. 2X and No. 2 plain for forward shipment at a very low figure, the metal to be shipped by eastern Pennsylvania furnaces. Malleable has sold in this district at $15.50, delivered, and will come from nearby furnaces. A lot of 500 tons of standard forge for early shipment was taken at $14.25, delivered. The Baltimore & Ohio railroad is inquiring for 1,000 tons of No. 1 and No. 2X for prompt and first quarter shipment at Baltimore. Since the recent heavy buying little pipe iron has been taken by the Delaware river shops. A Virginia pipe maker took 1,500 tons of lower silicons from a Virginia maker, but this is thought to be a part of sales recently reported. Basic has recently been quoted at $13.50, furnaces, equivalent to $14.25, delivered, but there is practically no demand for this grade. A leading eastern steel maker which bought heavily several months ago for last quarter has enough metal engaged to carry it to second half at present consumption. Some expiring contracts for low phosphorus are being renewed. Curtailment in the east is not yet ended, as a leading Lehigh valley interest is planning to blow out two additional furnaces by Jan. 1, leaving but one in action.

We quote for prompt and first quarter shipment at Philadelphia and vicinity, as follows:

No. 1X foundry	$15.25 to 15.50
No. 2X foundry	14.75 to 15.25
No. 2 plain	14.50 to 14.75
Standard gray forge	14.25 to 14.50
Basic	14.25 to 14.50
No. 2X Virginia	15.05 to 15.30
No. 2 southern	14.00 to 15.00
Standard low phosphorus	19.00 to 19.50

Coke.—Reports have reached the east of the probability of some shortage in spot coke by the first of the year. A lot of 2,000 tons of spot coke was taken this week at $1.60, ovens, and another similar sale at the same price was also closed. The forward market is no higher, as some eastern consumers have been able to close for first half at the same price done six months ago. Generally $1.65, ovens, is asked, but less is being done. Two Lehigh valley buyers are negotiating for first half.

Finished Material.—Some of the leading eastern railroad systems have been placing unusually liberal orders for plates, shapes and bars for shop work for immediate shipment, and some large contracts for such materials and standard spikes for forward shipment have also been closed. The market shows an undeniably stronger trend toward higher levels and leading independent sellers of the Pittsburgh district have followed the initiative taken by other large sellers and are quoting open schedules of 1.15c, Pittsburgh, on bars, 1.25c on plates and shapes and 1.90c on black sheets. Contracts are usually being held to first quarter, but some first half engagements are being made.

Despite the higher asking level of different leading makers, prices, in some cases at least, have not been firmly kept to these schedules. Some attractive contracts for plates and shapes have brought out exceedingly low prices within the week. The plate and shape market is quotable in this territory at 1.30c to 1.35c, Philadelphia, or 1.15c to 1.20c, Pittsburgh. The 1.35c price is being openly quoted by eastern makers, but with some exceptions, contracts have been limited to April 1. New business placed with eastern mills still reflects practically no improvement, and operations are not increasing. Buyers continue to manifest strong willingness to place forward contracts.

Bethlehem sections have been substituted for standard shapes in the proposed Eddystone, Pa., extensions of the Baldwin Locomotive Works, with which the directors the past week decided to proceed at once. The 3,500 tons now required will probably go to the McClintic-Marshall Construction Co. The Royster building, Norfolk, Va., upon which the steel requirements were reduced to 960 tons, went to the American Bridge Co. The new plant for the Central Foundry Co., at Tuscaloosa, Ala., 700 tons, has been awarded the Riter-Conley Mfg. Co. A garage for the Philadelphia Automobile Club, this city, 600 to 700 tons, is out. Several good-sized requirement contracts calling for about 15,000 tons of shapes and plates, have recently been taken in this and nearby districts, by Pittsburgh mills. The Baltimore & Ohio has awarded a small rail order to an eastern mill.

Bar iron shows a tendency to harden in sympathy with steel bars. At least one leading eastern Pennsylvania maker is quoting 1.20c, mill, or 1.30c, Philadelphia.

We quote, delivered in Philadelphia and vicinity, as follows:

Structural shapes, 1.30c to 1.35c; steel plates, 1.30c to 1.35c; steel bars, 1.25c to 1.30c; common bar iron, 1.20c to 1.25c; cut nails, 1.65c to 1.70c; blue annealed sheets, No. 10 gage, 1.65c to 1.70c; 4 x 4-inch open-hearth rolling billets, $21.40 to $22.40; forging billets, $26.40 to $27.40. Extras shown under Pittsburgh report.

Ship Yard Construction.—An unprecedented amount of ship construction still continues before eastern builders, some yards having bids out at present for as many as 30 contracts. Another merchant boat was placed this week in the east, calling for almost 1,000 tons of shapes and plates. The Reading railroad has placed ten sea-going coal barges with a Connecticut yard, but the steel tonnage is small. Bids go in at Washington, Jan. 4, on the two battleships, each of which will require 14,000 tons of shapes and plates exclusive of armor plate.

Old Material.—The market has become somewhat excitable and a further advance is general. Reports of greater activity in the Pittsburgh district have stirred vigorous bidding up of material, much of which is indi-

cated to be of a speculative character, particularly in heavy steel, as eastern steel makers are not buyers at present in the open market. At the same time, these consumers would take on some round tonnages at the prices that prevailed up to two weeks ago. On the railroad lists just closed, the steel went at about $12.75, delivered, or 50 to 75 cents higher than in November, and the No. 1 wrought at $15 to $15.50, delivered. Brokers are offering $12.50 for steel. A sharp movement in cast scrap has developed, sales this week aggregating fully 10,000 tons, including about 2,000 tons to a locomotive company. These purchases were made at about $13.25 to $13.50, delivered. Higher prices are reported. We quote gross tons, delivered in eastern Pennsylvania and New Jersey consuming territory, as follows:

Old iron rails	$16.00 to 16.50
Old steel rails (rerolling)	14.00 to 14.50
No. 1 heavy melting steel	12.25 to 12.75
Old car wheels	12.25 to 12.75
Old iron car axles	22.00 to 23.00
Old steel car axles	17.50 to 18.00
No. 1 R. R. wrought	15.00 to 15.50
Wrought pipe	11.75 to 12.25
Cast borings	8.00 to 8.25
Wrought turnings	9.00 to 9.50
Heavy cast scrap	13.25 to 13.75
Railroad malleable	11.25 to 11.75
Stove plate	10.50 to 11.00

Freight rates per ton on scrap from Philadelphia to principal eastern consuming points are; $0.60 to Ivy Rock, Pa.; $0.65 to Phoenixville, Pa.; $0.80 to Coatesville, Pa.; $0.85 to Bethlehem, Pa., Reading, Pa., and Roebling, N. J.; $1.10 to Pottsville, Pa., Lebanon, Pa., and Columbia, Pa.; $1.20 to Harrisburg and Steelton, Pa.; $1.40 to Milton, Pa.

BUFFALO

Fair Sales of Pig Iron, But Market Not So Active.

Buffalo, Dec. 20.

Pig Iron.—The sales for the district amounted to about 20,000 tons for the week, the principal buying being in the foundry grades for first and second quarter delivery. The inquiries amount to a considerable tonnage, but are lighter than they were during the previous week. It is believed this is due to the advances made by some of the interests. Some of the leading users of pig iron are still in the market and when their specifications have been closed the tonnage volume will be materially increased. The situation is much more encouraging from the producing viewpoint, although the basis of prices is far from what might be called satisfactory.

The prices obtainable, f. o. b. furnace, are substantially as follows:

No. 1X foundry	$13.50 to 13.75
No. 2X foundry	13.25 to 13.75
No. 2 plain	13.00 to 13.50
No. 3 foundry	13.00 to 13.25
Gray forge	13.00
Malleable	13.50 to 14.00
Basic	14.00 to 14.25
Charcoal	16.00 to 17.25

Finished Material.—The reports of the principal interests indicate that the better feeling still continues. The prices of 1.10c, base, on bars and 1.15c, base, on shapes have been wiped off the slate for immediate and first quarter deliveries, and in their place 1.15c, base, on bars and small shapes and 1.20c, base, on structural shapes and plates, for prompt delivery and first quarter on contract are being paid. There is a decided disinclination on the part of the mills to adhere to present prices for requirements beyond the first quarter of 1912. Contracts beyond the first quarter are being placed at a higher figure.

Some users of nails and wire tried to place a considerable tonnage at the old prices, but have been unsuccessful. It is evident there existed a feeling the market might go back again to the low figures, and those who followed this lead are now seeking to cover their requirements. The approach of the inventory period has not affected the nail and wire market. The customary slump has not as yet appeared.

The Niagara Chocolate Co., Niagara Falls, N. Y., is in the market for about 300 tons of structural material for its new plant.

Old Material.—The market here is very strong and the general line shows an advance of about 50 cents over the past two weeks. The railroads and the dealers find business better, but in the Buffalo district there is not as much buying as is reported from Pittsburgh and other sections. The activity seems to be more among the dealers than with the consumers. The latter here are apparently buying cautiously and in small quantities to keep the dealers from further advancing prices. The number of sales and contracts however show a considerable tonnage. Dealers report that the present advances have been accepted by the consumers without complaint. The indications point to a further raise in prices in practically all of the lines. We quote for the week, gross ton prices, f. o. b. Buffalo, substantially as follows:

Heavy melting steel	$13.00 to 13.25
No. 1 railroad wrought scrap	14.00 to 14.50
No. 1 R. R. and mch. cast scrap	13.75 to 14.00
Old steel axles	18.75 to 19.00
Iron axles	22.00 to 22.50
Car wheels	12.75 to 13.00
Railroad malleable, scrap	12.75 to 13.25
Wrought iron and soft steel turn.	7.50 to 7.75
Cast iron borings	6.75 to 7.00
Low phosphorus steel scrap	15.75 to 16.25
Old iron rails	15.00 to 15.50
Tank iron	10.00 to 10.50
Boiler plate, sheared	14.00 to 14.25
Pipe and tank	10.00 to 10.50
Stove plate	9.75 to 10.25
Sheet iron	7.00 to 7.50
Locomotive grate bars	11.00 to 11.25

ST LOUIS

Contract for Railway Exchange Building is Awarded.

Dec. 18.

Pig Iron.—Trading in pig iron seems to have dropped off, and local agents are not anticipating any material improvement until after the holidays. Inquiries are in the market for 500 tons of Lake Superior charcoal car wheel iron, 300 tons of coke car wheel iron, and 1,500 tons of southern iron, the latter for Quincy, Ill. A sale of 1,500 tons of foundry iron was made Saturday. Prices are firm at $10, Birmingham, for southern No. 2, and some of the larger furnaces are said to be asking $10.50. Northern iron is firm at $13 to $13.50, Ironton, with little inquiry. Our tabulated prices on southern iron delivered, to which the Birmingham freight of $3.75 has been added, follow:

Southern No. 1	$14.25
Southern No. 2	13.75
Southern No. 3	13.25
Southern No. 4	12.75

Coke.—Very little trading is going on in coke, and prices are unchanged as follows:

We quote 72-hour Connellsville foundry grades, $1.90 to $2.40 for whole of 1911; 72-hour foundry, $1.90 to $2.15 on tracks and for immediate delivery; 48-hour Connellsville furnace, $1.40 to $1.50; best 72-hour Virginia foundry, $2 to $2.25; 48-hour Virginia furnace, $1.60 to $1.85. The freight to East St. Louis and St. Louis is $2.80, and $2.70 from the Virginia fields when shipment is destined beyond St. Louis.

Finished Material.—The largest transaction in finished material that has taken place in the St. Louis territory for some time was the letting of the contract to Jones & Laughlin, of Pittsburgh, for the structural steel to be used in erecting the 21-story Railway Exchange (Barr) building, which will occupy an entire city block in St. Louis. About 10,000 tons will be required.

Old Material.—Scrap iron is steady with prices inclined to stiffen. Our tabulated quotations remain as follows:

GROSS TONS.

Old car wheels	$13.00 to 13.50
Old iron rails	14.00 to 14.50
Re-rolling rails (5 feet and over)	12.00 to 12.50
Old steel rails (3 feet and under)	10.75 to 11.25
Light section relayers (45 lb. and under) subject to inspec.	20.00 to 21.00
Re-laying rails, subject to inspec.	23.50 to 24.00

Frogs, switches and guards	10.00 to 10.50
Heavy melting steel	10.50 to 11.00
Shoveling steel	10.00 to 10.50

NET TONS.

No. 1 railroad wrought	$10.50 to 11.00
No. 2 railroad wrought	9.50 to 10.00
Arch bars and transoms	13.00 to 13.50
Knuckles, couplers and springs	9.00 to 9.50
Shafting	13.00 to 13.50
Iron car axles	17.00 to 17.50
Steel car axles	15.00 to 15.50
Locomotive tires	14.00 to 14.50
No. 1 country wrought	8.75 to 9.00
Pipe and flues	7.50 to 8.00
Tank iron and cut boilers	7.00 to 7.25
No. 1 cut busheling	8.50 to 8.75
No. 2 cut busheling	6.00 to 6.25
Cast and mixed borings	5.25 to 5.50
Machine shop turnings	6.25 to 6.50
Railroad malleable	9.50 to 10.00
Agricultural, malleable	8.50 to 9.00
Stove plates	8.75 to 9.25
Angle splice bars (iron)	10.50 to 11.00
Angle splice bars (steel)	9.25 to 9.50

NEW YORK

Large Pig Iron Buyers Still Negotiating Ferro-Manganese Advances.

Office of THE IRON TRADE REVIEW,
1115 West St. Bldg., Dec. 19.

Iron Ore.—It is indicated that the total shipments of foreign iron ore to the United States from all sources in 1911 will be 1,800,000 tons, a decrease of about 800,000 tons from 1910, which was a record year. As usual, Cuban shipments will be heaviest and the latest reports indicate the total will be between 1,000,000 and 1,100,000 tons. Ore buyers are still reluctant to take up the consideration of their next year needs and no developments in this direction have appeared.

Pig Iron.—Open inquiry is not so heavy, especially from the smaller melters, who have been buying quite freely, but the larger buyers in this territory have been closing for some round lots and are still negotiating. These purchases are usually being made quietly. The tonnage derived from these transactions probably, 20,000 tons, is keeping the market in a good tone. One leading consumer has bought through its New York office 4,000 to 5,000 tons of foundry and basic and is still negotiating for about 10,000 tons, delivery to be made over first half at different plants, some of them in the middle west. An eastern pipe maker has taken 7,000 to 8,000 tons of foundry grades for first quarter and first half delivery at several eastern plants; a sanitary ware manufacturer has bought against an inquiry for 5,000 tons of No. 2X for first half shipment at Uniontown, Pa., and is still inquiring for 2,000 tons for Connecticut delivery; the leading pump interest has bought about 3,000 tons additional, including 1,000 for Massachusetts and 1,000 tons for Harrison, N. J.; recent sales by a New Jersey stove maker amount to about 3,000 tons. Other sales include 1,000 tons of No. 2X to a condenser manufacturer and 1,000 tons of No. 2X to a New Jersey soil pipe maker, both for forward shipment. All these sales have been well distributed among Buffalo, eastern Pennsylvania and Virginia makers. In some cases, Virginia No. 2X has sold in New Jersey territory at a shade under $12.50, furnace. Some small sales of Virginia basic have been made at $12.50, furnace, for western shipment. Lehigh Valley iron has gone at from $14.00 to $14.25, furnace, with reports of some concessions. Considerable selling has been done into New England territory by New York state furnaces with freight advantages at around $15.25, delivered, for No. 2X. These sales include one lot of about 4,000 tons, another of 1,500 tons and some other business. Buffalo makers report a few small sales in New England on the advanced basis of $13.50, furnace, or $15.95, delivered, for No. 2X. The Thomas Iron Co. is planning the blowing out of additional furnaces in the Lehigh Valley, though it has but three of nine stacks active at present. We quote, gross tons, for prompt and first quarter shipment in New York tidewater, as follows:

Northern foundry No. 1	$15.00 to 15.25
No. 2X foundry	14.75 to 15.00
No. 2 plain	**14.50 to 14.75**
No. 2 Virginia	**15.05 to 15.30**
No. 2 southern foundry	14.50 to 15.00
Malleable	**15.00 to 15.25**
Gray forge	**14.25 to 14.50**

Ferro-Alloys.—All the leading English makers have withdrawn the $38.50, seaboard, price and are now quoting on the basis of $41.00, seaboard. No sales at the new level have resulted. Some consumers coincident with the advance, more freely offered business at $38.50, but considerable of this came out too late and was declined. Preceding the new announcement by sellers, sales were quite numerous and probably 7,000 to 8,000 tons were closed at prices ranging from $38.00 to $38.50, seaboard. The 6,000 tons of 50 per cent ferro-silicon for the United States Steel Corporation is still pending, but is generally conceded to a domestic maker. In the absence of sales, we quote 80 per cent ferro-manganese scale at $38.50, Baltimore, with an asking price of $41 and 50 per cent ferro-silicon at from $58.00 to $60.00, Pittsburgh and Philadelphia.

Cast Iron Pipe.—Several water and gas companies have closed upon their inquiries aggregating about 11,000 tons. The Public Service Corporation of New Jersey divided 4,800 tons between the Warren Foundry & Machine Co. and another maker. The United States Gas Improvement Co., Philadelphia, distributed 4,000 tons among the foundries in the Delaware river district. The New Haven Gas Co. also bought 2,150 tons. There is still a large inquiry pending for private buyers and makers report this as considerably larger than a year ago. In most cases, these have increased their requirements about 50 per cent. In public work, New Bedford, Mass., took bids this week on 700 tons and the Quebec letting, 18,000 tons, also went in. We quote 6-inch pipe at from $22.00 to $23.00, delivered, f. o. b. New York, in carload lots.

Finished Material. — Some of the largest sellers are taking the most complacent view of the situation they have had for several months, because of well filled order books, but it is apparent that this condition does not apply to all makers, particularly eastern plants. Those mills who have been slower to hold up at bottom levels are still keen for orders and are naming prices to fit the case wherever necessary. It is also clear that the largest sellers do not expect much business at their recently announced advances and the disposition to dip below these scales to take attractive lots still prevails. Several makers are openly naming 1.25c, Pittsburgh, on plates and shapes and report getting a little business at these prices, but there are plenty of lower sellers and the market rules at 1.15c to 1.20c, Pittsburgh. Steel bars are still quotable at 1.10c to 1.15c, Pittsburgh. Bar iron is strong. General business in this district reflects the usual slowdown at the holidays.

Awards in structural lines are not heavy, which is not unusual for this season of the year. Contracts placed include 3,500 tons for the Eagle loft, this city, to the Hay Foundry & Iron Works, for which a part of the plain work, at least, will come from the Eastern Steel Co.; 900 tons to the American Bridge Co., for an addition to the Hudson Terminal building, this city; 650 tons to the Harris H. Ures Iron Works, for a loft for the Park avenue & Fifty-fourth Street Co., this city; 400 tons to Milliken Bros., Inc., for the Bloomingdale Apartment, this city; 400 tons for a bather's pavilion, Coney Island, and 350 tons for the New York Edison Co., both to Payne Bros., Newark, N. J.; 250 tons to an independent shop for the residence of James Speyer, this city; bids have gone in for the Hess loft, this city, 2,000 to 3,000 tons. Another loft building uptown to require 1,500 tons is pending. The requirements of the Auerbach candy factory, this city, may be cut from 4,000 to 2,000 tons on final occasion, as bids have been taken alternately.

Bids have gone in on the remaining requirements of 40,000 tons for the approaches to Hell Gate bridge and it is reported in the market that an

independent shop has submitted the lowest tender. The main span of this bridge, 36,000 tons, went to the American Bridge Co. Several independent builders submitted bids in the recent competition. The Baltimore & Ohio has divided about 600 tons of bridge work among several independent shops. We quote, delivered at New York tidewater, as follows:

Plain structural shapes, 1.31c to 1.36c; tank plates, 1.31c to 1.36c; steel bars, 1.26c to 1.31c; common iron bars, 1.25c; plates and shapes from store, 1.70c to 1.80c. Extras shown under Pittsburgh report.

Old Material.—Considerable stir is to be noted in the market and there is much talk of higher prices, but buying by consumptive interests has not greatly increased. Much of the activity is apparently among brokers covering on open orders or carrying on speculative compaigns. In heavy steel, none of the leading eastern consumers are buying heavily. Some round lots of heavy cast scrap have been closed, including one of about 7,000 tons to a New Jersey consumer, which is understood to have gone around $13.25, delivered. The activity now prevailing from whatever source, has given the market a harder and more expectant tone. We quote, gross tons, prices New York dealers will pay at tidewater, with the exception of cast scrap, which has a local demand, as follows:

Old car wheels	$10.00 to 10.25
Old iron axles	18.25 to 18.75
Old steel shafting	13.75 to 14.25
No. 1 heavy melting steel	9.75 to 10.25
No. 1 R. R. wrought	12.00 to 12.50
Iron track scrap	11.25 to 11.75
Wrought pipe	9.25 to 9.50
Cast borings	6.00 to 6.50
Cast borings	5.75 to 6.25
Machine shop turnings	6.00 to 6.50
Railroad malleable	9.25 to 9.75
Stove plate	8.25 to 8.50
Grate bars	6.50 to 6.75

Freight rates on scrap per ton to Steelton, Pa., Columbia, Pa., Pottsville, Pa., and Harrisburg, Pa., are $1.50 from Jersey City and $2.00 from New York; to Coatesville, Pa., Ivy Rock, Pa., Phoenixville, Pa., and Reading, Pa., $1.50 from Jersey City and $1.80 from New York; to Bethlehem, Pa., $1.10 from Jersey City and $1.60 from New York; to Roebling, N. J., $1.00 from Jersey City and $1.50 from New York; to Milton, Pa., $1.60 from Jersey City, and $2.00 from New York.

BIRMINGHAM

Ten Dollar Quotation Pretty Well Adhered to For First Half.

Birmingham, Ala., Dec. 18.

Pig Iron.—The $10 schedule seems to be pretty well adhered to by all interests for any delivery running through the first half, although some sentiment seems to prevail to the effect that slightly higher prices should be asked for the second quarter. It remains a fact, however, that business can be done for the next six months at $10. A tendency to ask more for the lower grades is more marked, however. Sales have not been so good the past week, but with heavy orders booked there seems to be no inducement anywhere to shade prices. As a matter of fact, it is doubtful whether any iron of any kind was sold at any time in the last six weeks so low as some reports indicated. It seems that $9.50 to $9.75 was the very lowest price for analysis iron that would at all compare with a No. 2 foundry iron by fracture. Quotations are made approximately as follows, per gross ton, f. o. b. cars Birmingham:

No. 1 foundry and No. 1 soft	$10.50
No. 2 foundry and No. 2 soft	10.00
No. 3 foundry	9.50
No. 4 foundry and forge	9.25
Basic	10.00

Cast Iron Pipe.—Some fairly good orders from some of the smaller cities have been placed for the past week, and the run of carload orders continues good. Some of the pipe makers will be idle for a week or ten days in order to give their employes the Christmas holidays, and to enable them to take inventory for the close of the year's business. Shipments continue to approximate the make. There seems to be no anxiety to make sales, and certainly not at the expense of the prices, and quotations remain firm on the following schedule, per short ton, f. o. b. foundries Birmingham: 4 to 6-inch, $22.50 to $23; 8 to 12-inch, $21.50 to $22; over 12 inches, average $20.50. Gas pipe, $1 per ton higher.

Old Material.—Some of the dealers are becoming more interested in the scrap market and are taking on any tonnages that are offered them at bargain figures. Some dealers are holding their old stock at firmer prices. It is felt that if pig iron continues to move at a fair rate, it will result in a sympathetic movement in the scrap market. Dealers quote scrap iron approximately as follows:

Old iron axles (light)	$12.50
Old steel axles (light)	11.50
Old iron rails	11.50
No. 1 railroad wrought	9.50 to 10.50
No. 2 railroad wrought	8.50 to 9.50
No. 1 country wrought	6.00 to 7.00
No. 2 country wrought	5.60 to 6.00
No. 1 machinery cast	8.50 to 9.50
No. 1 steel	7.50 to 8.50
Tram car wheels	7.50 to 8.00
Standard car wheels	9.50 to 10.50
Light cast and stove plates	6.00 to 6.50

The enlarged foundries of the John A. Roebling's Sons Co. at Roebling, Pa., are running full operation day and night. The company is also rushing to completion 100 new homes for workmen at that place.

BRITISH IRON MARKET

Furnaces and Mills Well Booked and all Very Busy.

Office of THE IRON TRADE REVIEW, Prince's Chambers, Corporation St., Birmingham, Eng., Dec. 9.

Pig Iron.—There has been a steady improvement this week in the market for raw material. The over-eagerness of speculators to realize has slightly checked the northern market; but this check spent itself in a day or two, and the rising tide has again asserted itself. In Cleveland, shipments have been extremely heavy, and a peculiar feature is that the iron is going direct from the furnaces. Yet the stocks continue to decrease and now stand at 550,000 tons. The selling price is 47s 11d. ($11.72) for cash delivery, 48s 3d ($11.88) one month, and 48s 10d ($11.98) three months. Shipments would be still heavier, if sufficient vessels could be obtained. The hematite market continues strong, a marked improvement being manifest in the Barrow district. Stocks there remain at 51,000 tons. Books are well filled and the furnaces are being pressed for delivery both for forge and foundry. Similarly cheerful reports come from Scotland and Wales where furnace conditions are better than for years.

Finished Material.—The finished iron and steel departments continue to show great strength. The progress of unmarked bars in South Staffordshire is decidedly rapid. Nobody now accepts anything below £6 15s and £6 17s 6d is a common figure. It is almost certain that market bars will advance shortly, and at latest, there will be a rise on quarter day. There are very great demands of iron for car building by the rolling stock works in Birmingham and district. As in America, the British lines are badly wanting cars. Wire also has commenced an upward movement, a rise of 5s having taken place within the past few days, making the advance from the minimum 10s. A decided upward movement is expected in this branch, especially as enormous quantities are being taken for nails and screws. In the galvanized sheet department makers now get from £11 5s to £11 10s but the fierce competition keeps down prices, in spite of a great quantity of orders.

The Reading Steel Casting Co., Reading, Pa., has let the contract for the erection of an office building and a pattern shop. The new structure will be two stories high.

METAL MARKETS

St. Louis

Dec. 18.

Lead and Zinc.—The drop in spelter of from $6.85 to $6.10 within a few days last week, was followed by a decline in zinc blende in the Missouri-Kansas-Oklahoma district, 60 per cent qualities being offered in the open market at from $45 to $40 a ton. Choice lots sold as high as $48 a ton.

The contract basis for 60 per cent qualities was $49.55, with choice lots selling for $52. As a result of the change in terms of the contract system having nullified the liberal prices that have been paid heretofore, several companies have declined to sell on contract in future.

Choice lots of calamine sold as high as $30, with 40 per cent grades bringing $22 to $25 a ton.

The top price for lead was $63.50 a ton, a decline of 50 cents a ton.

Chicago

Chicago, Dec. 18.

New Metals.—Spelter has displayed considerable weakness during the past ten days and is now quoted 6.20c, Chicago, a reduction of $2 a ton under previous quotations. Lead is unchanged, although not quite so firm. Copper prices have been advanced in this market in sympathy with the rise in New York.

We quote, dealers' selling prices, f. o. b. Chicago, as follows:

Lake copper, carload lots, 14½c; casting, 14c, smaller lots, ¼c to ¾c higher. Spelter, car lots, 6.20c; lead, desilverized, 4.40c to 4.45c in 50-ton lots; corroding, 25c per 100 pounds higher; sheet zinc, $8.25 list, f. o. b. La Salle, in car lots of 600-pound casks; pig tin, 44¾c; Cookson's antimony, 9¼c; other grades, 8¼c to 8¾c.

Old Metals.—Copper prices are better, in sympathy with the higher prices on old copper, but tin and aluminum are weaker. The general conditions in the market show no particular change.

We quote, f. o. b. Chicago, as follows:

Copper wire, crucible shapes, 13c; copper bottoms, 11c; heavy cut crucible copper, 11½c; heavy red brass, 12c; heavy yellow brass, 8¾c; No. 1 red brass borings, 9½c; No. 1 yellow brass borings, 8¼c; brass clippings, 8½c; lead pipe, 5c; zinc scrap, 5.50c; scrap aluminum, 12c; tea lead, 3¾c; No. 1 pewter, 28c; block tin pipe, 37c; tin foil, 35c; linotype dross, 3¼c; electrotype dross, 3c; stereotype plates, 4½c; stereotype dross, 3¼c; prime slab zinc dross, $88 to $90 a ton.

New York

Dec. 19.

Tin.—A sensational advance in spot of £5 10s to £205 in the London tin market Monday raised local prices sympathetically, but little business has been done in the metal here. There is a margin of 1c per pound between the bid and asked prices at the close of business today, which reflects both light demand and a small amount of offerings. The liberal total of arrivals so far this month have not afforded much relief from the scarcity of spot stocks felt here, at the end of November and this leads to the conclusion that shipments to the interior have been quite large. Small lots could probably be had today at 45.-12½c. Arrivals since Dec. 1, aggregate 3,005 tons, and there are 1,645 tons afloat.

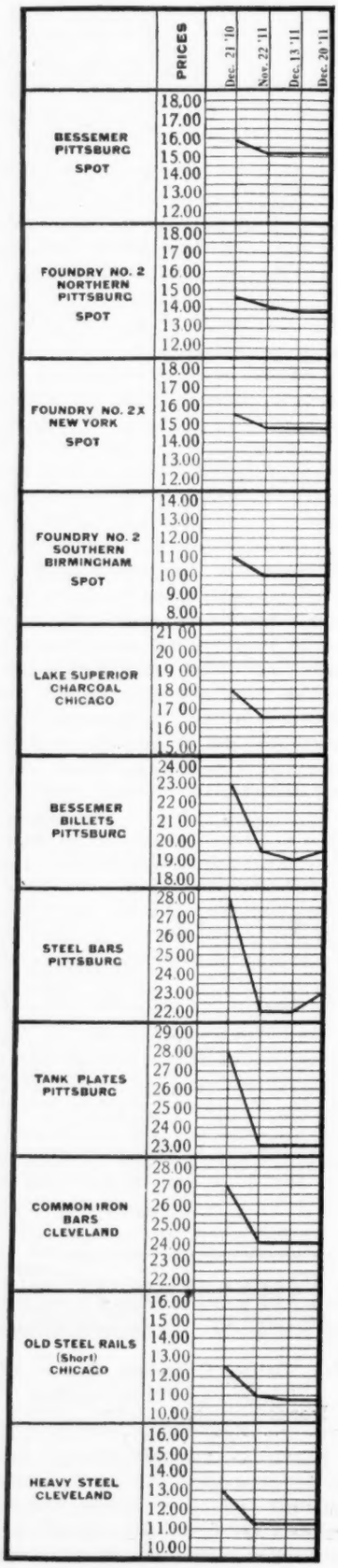
Copper.—The pronounced strength of last week's market has been supplemented during the past by a further advance in price of ⅜c per pound. Both the consuming and speculative interests abroad bought heavily in this market, and domestic manufacturers also have shown greater interest in the metals than for some time. The London standard market advanced to £62 2s 6d for spot and £63 3s 9d on active buying yesterday, and a general level of 14c has been established in the domestic market. Lake is quoted at from 14c to 14.12½c, electrolytic at 13.87½c cash New York and 14c delivered, and casting at 13.87½c. Domestic consumers appear to be less suspicious of the advance though they still display some hesitancy in covering for an extended time. Exports since Dec. 1, are the largest for this period of any month since Jan. 1. The aggregate so far are 22,776 tons.

Lead.—The open market demand for lead continues light and prices are unchanged. Independent interests are quoting 4.50c in New York and the leading sellers 4.45c for shipments.

Spelter.—The market is still unsettled, and buyers are displaying little interest in it. The unbiased trade opinion is that very little metal has changed hands since the decline from around 7c. Nominally the market is 6.40c in New York for spot and 6.30c for prompt shipments.

Antimony.—The market is dull, and practically unchanged in prices. Cookson's is 7.75c to 7.87½c. Hallett's is 7.70c and Hungarian is 7c.

PRICE CHART



WARWICK FURNACES

Will Probably be Leased by Eastern Steel Co.

New York, Dec. 20. (By wre.)—Negotiations are under way, but have not yet been finally consummated, for the leasing of the blast furnace plant of the Warwick Iron & Steel Co., Pottstown, Pa., by the Eastern Steel Co., Pottsville, Pa., for a long term of years. The purpose of the transaction now pending will be primarily to supply the Eastern Steel Co. with a permanent base of pig iron supply. No plans for enlargements or extensions have been considered or are in contemplation by the prospective lessee, dependent upon the consummation of the present negotions. Any such plans of this nature such as the closer connection of the two plants, it is stated, are matters for future development.

The Warwick Iron & Steel Co. is one of the oldest and most prominent merchant iron makers in the east. It operates three stacks at Pottstown, two owned and one leased from the Pottstown Iron Co., with annual capacity of about 275,000 tons. The Eastern Steel Co. operates an open-hearth plant and structural shape mills at Pottsville with crude steel capacity of 200,000 to 250,000 tons per year. Two 80-ton open-hearth furnaces were recently completed. The company has been an important buyer of basic iron in the eastern market. The two plants are 60 miles apart, so that the use of the hot metal from the furnaces is not possible under the present condition.

Affairs of Western Steel Badly Tangled

Creditors of the Western Steel Corporation have elected Lester Turner, Sutcliffe Baxter and Edgar Ames as trustees. In a report recently filed in the United States district court by the receivers of the company, it was stated that its affairs were in such a tangle it was almost impossible to straighten them out, and the methods employed by James A. Moore, president and organizer of the corporation, were severely criticized. He is charged with speculation and inflation. An offer made by the Metropolitan Trust Co., of New York, to take over and operate the plant at Irondale is being considered.

The schedules in bankruptcy were also filed in the United States district court, Seattle, on Dec. 19. They show liabilities of $1,492,400, and assets of $7,339,865. Real estate forms the largest asset, being placed at $6,942,662. The largest liability is for secured claims of $810,181, and the second largest, $625,514, is for unsecured claims.

SHIPMENTS HEAVY

And Little Foundry Iron in Valley Furnace Yards.

Pittsburgh, Dec. 20. (By wire.)—Shipments of foundry pig iron this month have been very heavy and there is little No. 2 foundry iron on furnace yards in valley districts. A number of the larger buyers have quietly covered this month for first quarter and first half, and several sales ranging from 300 to 1,000 tons each are reported this week. As a result of the recent buying, $13, valley, is now the minimum for No. 2 and some furnaces are not quoting this figure, especially for forward delivery. Some furnaces have also withdrawn low quotations on gray forgings.

The sale of 25,000 tons of Bessemer to the Youngstown Sheet & Tube Co. has given the market a firmer tone. Another sale of 500 tons of Bessemer to a steel casting interest at Detroit is reported at $14.25, valley.

Lake Michigan Ore Receipts

During 1910 Lake Michigan ports received a total of 7,452,084 gross tons of ore. It was natural, of course, that they should have received less this year than last owing to the lessened movement in general, but it has more than maintained its proportion of the movement. Following are the Lake Michigan receipts by ports for 1911:

Port.	Gross tons.
South Chicago, Ill.	3,685,100
East Jordan, Mich.	36,232
Elk Rapids, Mich.	26,814
Indiana Harbor, Ind.	365,312
Milwaukee, Wis.	109,255
Gary, Ind.	1,302,745
Boyne City, Mich.	33,000
Total	5,558,458

Ferro Alloy Price

Pittsburgh, Dec. 20. (By wire.)—All local dealers are now quoting $41, seaboard, on ferro-manganese. This is the high point of the year 1911. In September sales were made as low as $36, seaboard.

Howard Works on Full

Pittsburgh, Dec. 20. (By wire.)—The Howard Axle Works, Homestead, Pa., have been placed in full operation this week for the first time in more than a year.

EXPORT SALES

Of Pig Include Valley Iron for the Philippine Islands.

Export sales of American pig iron have been more numerous during the past several weeks and most of this business has been taken by southern furnaces for foundry grades. One lot of 10,000 to 15,000 tons of foundry iron has been sold for shipment to Austria and another of about 1,000 tons of southern No. 3 for Italian account. The prices made on this business are understood to have been on the basis of $9.25, Birmingham, for No. 3.

Small shipments of foundry and malleable grades of pig iron have been made recently by Mahoning valley interests to the Philippine Islands and to New Zealand, and there have also been some small sales from other districts to continental Europe. The iron is made up of trial lots for consumption in these countries and this business may be followed subsequently by additional orders. In prices, the producers were enabled to obtain a higher figure than that now ruling in the domestic market in the valleys. Exports of pig iron by American furnaces, particularly those in the eastern Pennsylvania district, were heavier about ten years ago than they are today, and a considerable tonnage was shipped abroad. The expansion of the European iron making industry, especially Germany, has checked the great part of any strong foreign movement of iron at the present time. The Warwick furnaces at Pottstown, Pa., have frequently, in time past, shipped considerable metal abroad.

Extension of Time Granted

New York, Dec. 20. (By wire.)—Some subsidiaries of the United States Steel Corporation have been granted extensions of time for answering the government suit for dissolution and it is not likely that the general answer of the Corporation will be filed until after Jan. 1.

New Brass Foundry.—The Hydraulic Press Mfg. Co., Mount Gilead, O., has recently completed arrangements for installing a new brass foundry, which will turn out castings for the use of the company and also supply customers. This company is best known as a manufacturer of hydraulic cider and grape juice machinery, but in recent years has been making heavy hydraulic machinery.

Percentage of Charcoal Iron in Car Wheels

To the editor of The Iron Trade Review:

As to your question: "What percentage of charcoal iron is used by the average foundries in making their so-called charcoal iron wheels?"

This is by no means easy to answer, as percentages vary. The Pennsylvania, Chicago, Milwaukee & St. Paul and the Norfolk & Western railroads make cast iron wheels—probably 1,800 per day—in the manufacture of which a charcoal iron mixture is used; also, wheel makers use charcoal iron for the manufacture of special wheels, a fair estimate being a total of 3,500 wheels per day in which charcoal iron, not exceeding 25 per cent of the mixture is used. As the total production of cast iron wheels in the United States and Canada approximates 20,000 per day, it will be seen that more than 16,000 cast iron wheels are made daily, in the manufacture of which no charcoal iron is used, these being largely a remelt of scrap wheels heavily loaded with from 0.12 per cent to 0.25 per cent sulphur, the bad effect of which being neutralized by the use of ferro-manganese, and which are now being sold under severe competition for about 90 cents per 100 pounds. If it be considered that with good foundry practice, the overhead charges for coke, molding, labor, etc., are not less than $6 per ton, the remaining $12 per ton, or less, will indicate the quality of material used in the manufacture of four-fifths of all the cast iron car wheels made.

For this condition many of our railroads are in a measure to blame, as, under the method or system of purchase, wheel makers are handicapped by being forced to receive old wheels in exchange for new to the extent of 100 per cent, and which forces them to favor a remelt wheel, as any other practice would mean heavy accumulation of scrap, for which—owing to its high sulphur content—there is but little market. If this method of payment was changed so that scrap wheels would be returned only to the extent these are used in new wheels furnished, it would change the attitude of wheel makers, as they could then, at a proper price, make cast iron wheels of the best quality and have money to pay pig iron bills with instead of an accumulation of scrap.

As I understand it, the solid steel wheel is purchased without return of scrap (evidenced in "scrap lists" issued monthly) and with the burden of demonstration entirely upon the railroads. Why not be as fair with the cast iron wheels? At present many railroads are not willing to order wheels of high grade at a proper price and test them for their own information, but demand additional guarantees for extra price required, thus throwing the burden of demonstration entirely upon the wheel maker.

That there is better material for the manufacture of cast iron car wheels than high sulphur scrap, doped up with ferro-manganese, is an unquestioned fact. In the Lake Superior district, special charcoal iron is produced in large quantity that will easily average 25,000 pounds transverse strength on bars 2 inches square, broken 12 inches between supports, and tensile strength from 32,000 to 38,000 pounds per square inch; this also being of close grained structure and of excellent chilling quality, making it the highest grade material for cast iron wheel manufacture.

Recently, one of our northern railroads ordered some special wheels which were made with 50 per cent "Marquette Special" brand of charcoal pig iron, and 50 per cent selected scrap wheels. These wheels—33 inch M. C. B., 725 pounds type, No. 2 type—were made without the use of ferro-manganese, ferro-silicon, or alloys of any kind in either cupola or ladle, the test wheel breaking at the 115th blow under the regular M. C. B. drop test of 220 pounds weight falling 12 feet. These wheels are being placed under heavy engine tanks where they will be subject to the heaviest service of grade and curvature, and, from the high strength and intense hardness of chill shown, it is believed a very high mileage will be obtained. Here is the case of a railroad taking the initiative for better car wheels, not only in paying a proper price therefor but in placing them in service where accurate observation and record, will determine their value. If railroads generally would adopt this plan and demonstrate for their own information what can be established in cast iron wheels with the use of high grade charcoal pig iron, it would soon become clear that these can be made for safe service under the heaviest equipment, and at a very moderate cost as compared with the cost of solid steel wheels.

The car wheel question is of the greatest importance to all practical railroad officials, on whose tables the broken wheel flange with its bluish, rusted, discolored crack, is everywhere found. It causes, so many railroad officials say, the gravest concern, and an earnest desire for better conditions, but unless the practice of exchanging old wheels for new, paying the difference at the lowest competitive price, is modified, there will be but little betterment.

The standing wheel committee of the Master Car Builders' Association—a most capable organization—has done faithful work in recent years, but their efforts being largely along the lines of chemical analysis, have not been productive of the best results. If the committee would take up the matter practically, by making test wheels from such mixtures as scientific and experimental investigation indicates, and then place them in service for observation and record, or, for scientific shop tests in addition to that required under the Master Car Builders' Rules, it would soon end all controversy over the car wheel question.

Very truly yours,

Wm. Gerhauser,

Secretary of Superior Charcoal Iron Co.

Detroit, Dec. 13, 1911.

Crucible Earnings.—The quarterly statement of the Crucible Steel Co. of America for the period ending Nov. 30, shows net profits of $729,710, as compared with $664,245 for the same period in 1910, an increase of $65,464. Profits for September were given as $306,452; October, $459,570, and November, $374,985, making a total of $1,141,007. Appropriations for depreciation, repairs, contingencies, corporation tax, etc., amounted to $411,297.

The Sheet Products Co., capitalized at $750,000, which has a plant at Morrisburg, Ont., will move to Port Arthur and engage in the manufacture of sheet metal, employing 200 men.

RIGID RULES

Will Govern Inspecting and Testing of Canadian Locomotives.

Toronto, Dec. 16.—Commencing Jan. 1, the inspection and testing of locomotives on all railways under the jurisdiction of the railway commission of Canada will be governed by new and rigid rules, designed for the safety of the public, fixing the responsibility for accidents caused by defective boilers. They provide that companies are to be responsible for the general design and construction of locomotive boilers under their control. A safe working pressure is to be fixed by the chief mechanical officer of the company, or a competent mechanical officer in charge at each point where boiler work is done will be held responsible for the inspection and repair of all boilers. Rules governing the details of this inspection are given, and it is ordered that not less than once each month, or 15 days after inspection, a report of the inspection is to be filed with the chief operating officer of the board for each locomotive used. In case of accident from failure of locomotive boiler resulting in serious injury or death the company owning or operating the locomotive is required to notify immediately the board's operating officer. A penalty of $100 is fixed for the violation of any of the rules.

The Russell Motor Car Co., of Toronto, is doing a large and increasing business in the Australian market. Heavy shipments are being made monthly and new orders are coming in as rapidly as those in hand are being filled.

The Canadian Northern railway has let the contract for the last link of the eastern section of its trans-continental line, between Ottawa and Pembroke, a distance of about 90 miles, to J. P. Mullarkey, of Montreal. The bridges across the Ottawa river at Fitzroy Harbor and Portage du Fort will be constructed during the winter.

The Canadian Northern Coal & Ore Docks Co., of Port Arthur, has let a contract to the Barnett-McQueen Co. to double the coal handling capacity of its plant. The work will cost about $500,000 and will employ 200 men during the winter.

The assets of the Canadian Gas Power & Launches, Ltd., engine and launch manufacturers, Toronto, are offered for sale as a going concern by tenders to be received by John Mackay, liquidator, Toronto, up to Jan. 31.

MACHINERY COMPANY

Being Investigated in Canada Under The Combines Act.

Toronto, Dec. 18.—The investigation held under the combines act into the methods of the United Shoe Machinery Co. of Canada, a subsidiary company of the United Shoe Machinery Co. of Boston, which has been in progress in Montreal since Dec. 4, was adjourned Dec. 15, to be resumed at Quebec, on Dec. 19. F. W. Knowlton, manager of the Canadian company, was under examination for seven sessions. He gave important testimony regarding the "tying" clauses of the company's leases of machines forbidding the use of the machinery of other manufacturers. In cases where these clauses were broken, the company could either cancel its leases and remove the machinery, or force a continuance of the leases, and compel the removal of the machinery objected to. He stated that, with the exception of one or two isolated instances, practically no machinery was used in Canada in the business, other than that of the United Shoe Machinery Co. Most of the supplies were shipped from Montreal, but in some instances they were shipped direct from the United States. The roadmen of the company had to see if the machines were kept busy and in good repair and had also to report if other machinery was used. The history of how the company had obtained control of the Goodyear Shoe Machinery Co. and absorbed other competitors was fully gone into. As a rule, the company bought the machinery from its rivals at about 10 per cent of its original price and sent it out for scrap. Mr. Knowlton detailed the circumstances of the difficulty with Brunet, Lachance & Tanguay, shoe manufacturers of Quebec, who had requested the company to remove their metallic department machines, as they were replacing them by others. The company refused to do this and under their agreement compelled the firm to pay royalties on the machines after it had ceased to use them.

At the conclusion of Mr. Knowlton's examination Mr. Falconer, K. C., counsel for the complainants, declared he had all the information he desired. At the sitting to be held in Quebec the manufacturers, upon whose petition the proceedings were taken, will be examined.

The contract for the erection of the new plant of the John Deere Mfg. Co., agricultural implement manufacturer, at Port Colbourne, Ont., has been let to the Leonard Construction Co. It involves the entire rebuilding of the present factory and the erection of a new three-story warehouse of brick and re-inforced concrete 150 feet square and other buildings, besides 50 to 75 new houses for employes. The Grand Trunk Railway is running a switch into the property. When completed, 500 men will be employed.

Preparing to Reorganise Allis-Chalmers

Protective committees have been formed for both the preferred and common stockholders of the Allis-Chalmers Co., in anticipation of the company's financial reorganization. The preferred stock will be represented by Charles Allis, chairman; C. W. McGarrah, president of the Mechanics' and Metals' National Bank; W. E. Roosevelt, of Roosevelt & Son; M. N. Buckner, vice president of the New York Trust Co., all of New York, and H. W. Falk, president of the Falk Trust Co., of Milwaukee. The New York Trust Co. will act as depository for the stock, for which receipts will be issued. Alexander J. Hemphill is chairman of the common stockholders' committee and the Guaranty Trust Co. the depository. The committee says: "Present conditions require concerted and vigorous action by preferred stockholders who are, therefore, requested to deposit their certificates for preferred stock without delay with the depositary, subject to the terms of the agreement."

Blast Furnace Plant Sold

The blast furnace plant of the Hamilton Iron & Steel Co., at Coke Otto, near Hamilton, O., which was sold at public auction on Dec. 14, was bid in by D. M. Peters of Hamilton, manager of the Coke Otto plant and chairman of the bond holders committee. Mr. Peters' bid was $375,000.

The United Shoe Machinery Corporation has declared the regular quarterly dividend of 1½ per cent on preferred stock and 2 per cent on common stock.

The Otis Elevator Co. has declared the regular quarterly dividends of 1½ per cent on preferred and 1 per cent on common stocks, payable Jan. 15.

STACKS BLOWN IN

Because of Heavy Shipments Being Made In Eastern Pennsylvania.

Owing to the heavy shipments now being made from the furnaces in eastern Pennsylvania, several additional stacks will be put into blast shortly.

The furnaces at Swedeland, Pottstown, Birdsboro, Coatesville, Keystone, Reading, Macungie, Robesonia and Emaus are blowing. The one at Temple has been overhauled and can be put in operation in a few days. The second stack of Worth Bros. Co., at Coatesville, is finished. The Sheridan furnace is practically ready to start. Leesport stack is undergoing repairs.

In the Lehigh valley 11 of the 22 stacks are in blast; in the Schuylkill valley, 8 of the 16, and in the Lebanon valley 5 of the 10 stacks.

To Begin Additions to Baldwin Plant

At a meeting of the directors of the Baldwin Locomotive Works, which was held in Philadelphia, Dec. 14, it was decided to proceed at once with the enlargement of the company's plant at Eddystone, Pa. The additions will be extensive, consisting of a number of sections of a duplicate type, each being of shorter length than the one it adjoins latterly. It is probable that the Philadelphia plant will eventually be moved to Eddystone, and the company's works centralized at that place.

Steel Barge Launched

The Jones & Laughlin Steel Co., on Dec. 13, launched an all-steel coal barge, 200 feet long with a carrying capacity of 4,100 tons. This is the second steel barge turned out at the company's Keystone, Pa., works.

Strike Settled

The strike of Sons of Vulcan puddlers at the Girard, O., mills, of the A. M. Byers Co., which has been on for seven weeks, was adjusted Dec. 18, and all the old men taken back to work.

The Baldwin Locomotive Works has declared an initial dividend of 1 per cent on common stock and the regular semi-annual dividend of 3½ per cent on preferred stock, both payable Jan. 2.

Personal

Dr. Paul Heroult, who is the author of the method of electric steel making known as the Heroult process, has sailed for Europe.

L. M. Hardenburg has been appointed general superintendent of the Gogebic mines of Pickands, Mather & Co. with headquarters at Ironwood.

H. S. Snyder, vice president of the Bethlehem Steel Corporation, has returned from a business trip to Buenos Ayres.

Milton O. Knauss has been made superintendent of the Crane furnace plant of the Empire Steel & Iron Co., at Catasauqua, Pa., succeeding Harry R. Hall, recently deceased.

Charles W. Hays has been appointed acting manager of the mine machinery plant of Boyts & Co., Connellsville, Pa., following the death of B. F. Boyts.

W. D. Hawkins, formerly of the Hill-Hawkins Boiler & Tank Works, is now connected with the tank department of the Kennicott Co., with headquarters in the Corn Exchange Bank building, Chicago.

Albert Ladd Colby, consulting engineer, 165 Broadway, New York City, has returned from a three months' study of the latest developments in German by-product coke manufacture.

W. T. Thompson, formerly general manager of the Iroquois Iron Works, Buffalo, has been elected vice president and general manager of the Monarch Road Roller Co., Groton, N. Y.

F. E. Bachman has resigned as general manager of the Northern Iron Co., operating furnaces at Port Henry and Standish, N. Y. He had occupied that position since the formation of the company in 1902.

H. M. Moore, formerly connected with the Cincinnati Punch & Shear Co., Cincinnati, as general manager and later associated with the Ironton Punch & Shear Co., successor to the Cincinnati Punch & Shear Co., has severed his connection with that concern.

J. C. Maben Jr. has been elected vice president, of the Sloss-Sheffield Steel & Iron Co. in charge of operations. J. W. McQueen continues as vice president in charge of sales and financial operations. President J. C. Maben Sr. will remove from Birmingham, Ala., to New York.

James Bonnyman has resigned as vice president of the Birmingham Coal & Iron Co., Birmingham, Ala., recently merged with the Woodward Iron Co. Mr. Bonnyman will be president of a new company, the Bonnyman-Norman Coal & Iron Co., of which James A. Norman will be vice president and treasurer, and A. H. Andrew secretary. The company will be sales agents for the Brookside-Pratt Mining Co.

J. M. Studebaker Sr. has retired from the presidency of the Studebaker Corporation of America, and Fred S. Fish has been elected to succeed him. Mr. Studebaker will serve as chairman of the board of directors of the company.

J. N. Gunn, of New York, has been appointed general manager of the Studebaker factories in South Bend, Ind., Detroit, Pontiac, Mich., and Elyria.

S. H. Chauvenet, general manager of the Berkshire Iron Co., operating its Sheridan furnace at Sheridan, Pa., has been elected president of the Eastern Pig Iron Association for the year of 1912, succeeding Albert Broden, superintendent of blast furnaces of the Reading Iron Co., who served during the present year. W. S. Pilling, of Pilling & Crane, Philadelphia, has been re-elected secretary of the association. These selections were made at the final meeting of the year held at Philadelphia.

Obituary

David J. Thomas, treasurer of the Sterritt-Thomas Foundry Co., Pittsburgh, died Dec. 12.

Louis Demuth, head of the firm of Wm. Demuth & Co., 507 Broadway, New York, pipe manufacturers, died Dec. 14, at New York, aged 49 years.

David J. Thomas, aged 79 years, for many years identified with the Sterrett-Thomas Foundry Co., Pittsburgh, died Dec. 12, at Pittsburgh.

Frank Eyre, superintendent of the Hamilton Otto Coke Co., near Hamilton, O., was killed on Dec. 14, by falling into a tank of hot tar at the company's plant.

Frederick C. Williams, aged 75, died at Los Angeles, Dec. 17. Mr. Williams was manager of Borsum Bros. of New York, special designers of armor plate, for more than 20 years. He retired from active business several years ago, and had gone to California because of ill health.

William J. Carlin, aged 55 years, president of the Thomas Carlin Sons Co., and the W. J. Carlin Co., Pittsburgh, died Dec. 12, at the family residence, Pittsburgh, after a short illness of pneumonia. Mr. Carlin was an active member of the Pittsburgh Chamber of Commerce and the Manufacturers' Association of Pittsburgh.

Ralph E. Lawrence, aged 39, general agent of the Wabash railroad, with headquarters in Pittsburgh, died recently at his home, 20 Walnut street, Crafton. Mr. Lawrence was a well known railroad man, and has held several important positions. He was general agent for the Wheeling & Lake Erie, at Wheeling, for 15 years, which position he resigned in 1908, to accept the one with the Wabash that he held before his death.

Harry R. Hall, superintendent for the past six years of the Crane furnaces of the Empire Steel & Iron Co., at Catasauqua, Pa., died in the German hospital, Philadelphia, Dec. 10, following an operation. He was a graduate of Ohio State University and after leaving college obtained a position as analytical chemist with the Carbon Steel & Iron Co., Parryville, Pa. He was also at different times connected with a number of other iron and steel companies and public mention was frequently made of records achieved at blast furnaces of which he had charge. Mr. Hall was a member of the American Institute of Mining Engineers.

Thomas Noble Miller, aged 76, a former iron manufacturer, of Pittsburgh, and former partner of Andrew Carnegie and Henry Phipps, died Dec. 16, at his home, Penn avenue, Pittsburgh, from pneumonia. Mr. Miller had been at Hot Springs, Ark., and returned to his home a few weeks prior to his death.

Mr. Miller was born August, 1835, in North avenue, Northside, Pittsburgh. During his boyhood days he had for playfellows Andrew Carnegie and Henry Phipps. At the age of 15, he left school and went to work for a business house as shipping clerk. In the evenings he attended night school with Mr. Carnegie and Mr. Phipps. At the age of 22 Mr. Miller became purchasing agent for the Ft. Wayne railroad. On May 2, 1864, he induced Andrew Carnegie, who at that time was superintendent of the Pittsburgh division of the Pennsylvania railroad, to buy a sixth interest in the Iron City Forge Co., Mr. Phipps and Mr. Miller having formerly become interested in this concern. Three years later, Mr. Miller disposed of his holdings to Mr. Carnegie. Later Mr. Miller was identified with the Atlas Machine Co. and a few years later became affiliated with the Columbia Oil Co. In recent years, a great deal of his time was devoted to banking and real estate interests. Mr. Miller was the sole surviving member of his family.

The World's Largest By-Product Coke Plant

A Description of the Electrical Equipment of the Koppers Coke Oven Installation at Gary, Ind.

At Gary, Ind., the Indiana Steel Co., a subsidiary of the United States Steel Corporation, has under construction the largest by-product coke plant in the world. It consists of 560 Koppers regenerative by-product coke ovens, designed and built by H. Koppers, Joliet, Ill. These ovens will have a total coke-making capacity of 8,000 tons in 24 hours and are equipped with the Koppers direct process for recovering ammonia from the gas in the form of ammonium sulphate. This is the first coke oven plant in this country installed with this direct process for ammonia recovery.

This plant is of particular interest as it is electrically-operated throughout by motors receiving their current from the gas producing plant of the Indiana Steel Co. The coal-handling equipment for a plant of this size must necessarily be of enormous capacity and the plant installed measures up to the requirements of the coke ovens. In this article the coal will be followed from its arrival at the storage yard to the breaking and crushing building on to the mixer building and finally to the coke ovens. The coke will be followed from the ovens until it is quenched and ready for the blast furnaces and the course of the coke oven gases will be traced through the by-product house until freed of tar and ammonia and ready for use in the coke ovens and in the soaking pits of the works of the Indiana Steel Co.

Coal for coke making is dumped from railroad cars into a concrete storage yard which has a capacity of 350,000 tons. The walls of this yard are inclined under the railroad tracks to deflect the coal away from the sides of the yard so that grab buckets of two large Wellman-Seaver-Morgan coal bridges can reach it with greater ease.

The bridges are each equipped with 7-ton buckets and can load twenty 50-ton larry cars per hour. Their closing and opening lines and trolley travel are each operated by a 150-horsepower General Electric, type MI motor and the two bridge trucks are operated by eight 30-horsepower motors of the same type.

Coal, after being loaded into a transfer car, is dumped into one of 12 hoppers at the unloading house. These hoppers are each equipped with a shaker distributer driven by a 15 horsepower General Electric, 3-phase, squirrel cage induction motor. Each of the shakers can evenly distribute 40 tons of coal per hour on the belt conveyors. A continuous supply of coal is assured by keeping one hopper full at all times.

The coal is carried from the unloading house by four belt conveyors, each of which has a capacity of 500 tons an hour. They are driven by four 30-horsepower, 3-phase, form K, General Electric induction motors, which together with those used to operate the Bradford breakers, hammer mill crushers and intermediate conveyors are controlled by a special electrical interlocking system. The stopping of any conveyor or machine automatically holds up all operations prior to its own, thereby preventing waste or jamming.

The unloading house conveyors carry the coal to Bradford breakers, each of which has a capacity of 500 tons an hour. It is here broken to one inch mesh and separated from what little slate, stone, wood, iron, etc., it may contain. Power for this operation is furnished by four 75-horsepower 3-phase, General Electric motors.

Between the breakers and the next operation, crushing the coal in hammer mill crushers so that 85 per cent of it will pass through a No. 64 wire mesh screen, are four conveyors each with a capacity of 500 tons an hour, which are driven by four 30-horsepower, 3-phase, induction motors. The eight hammer mill crushers with a capacity of 350 tons per hour are driven by 250-horsepower, 3-phase form K, induction motors.

As the coal crushing house is thick

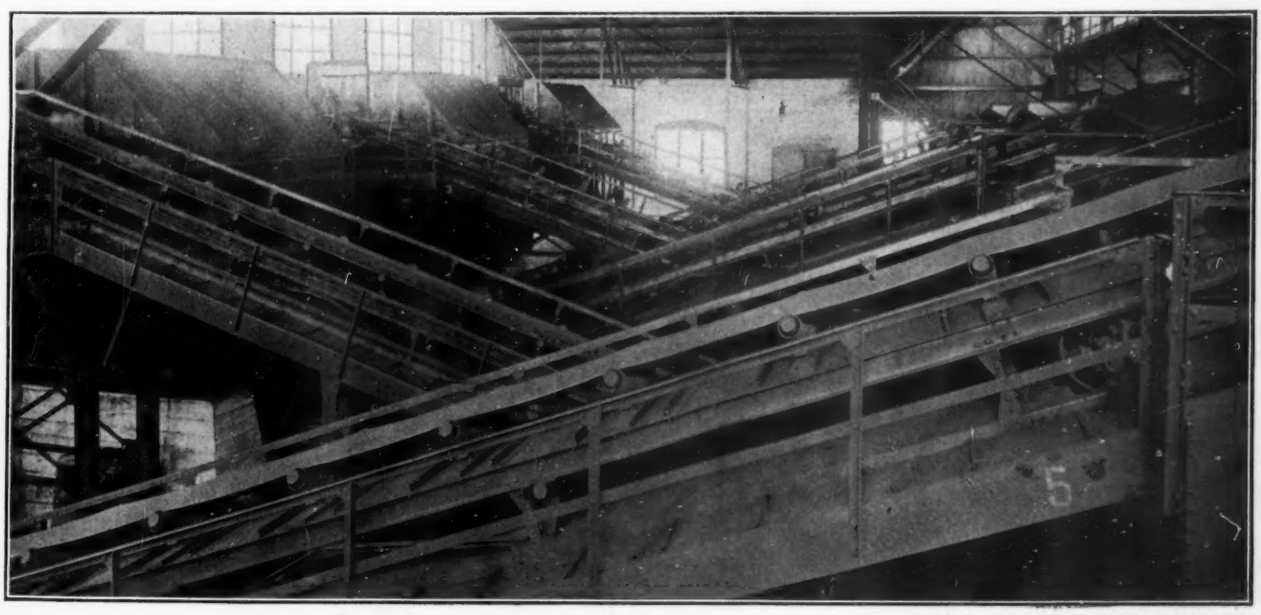


FIG. 1—THE CONVEYORS BETWEEN THE BREAKERS AND HAMMER MILLS

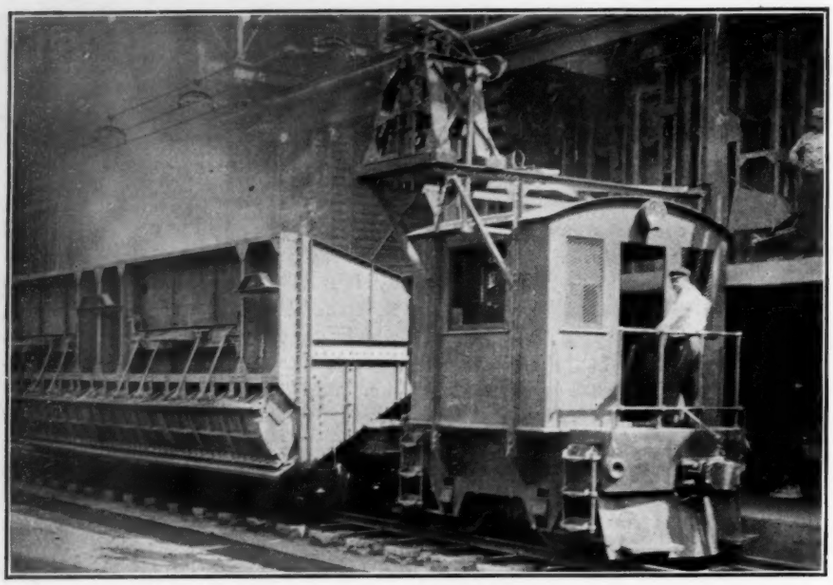


FIG. 2—LOCOMOTIVE AND CAR ON THE DISCHARGE SIDE OF THE OVENS; THE PARTIAL QUENCHING OF THE COKE TAKES PLACE AT THIS POINT

with coal dust floating around in the air, all motors used in it are in a separate room built on the side of the house. In many other cases, however, conveyor motors, located near conveyors in other buildings, are showered with coal dust.

Crushed coal is carried from crusher house to a mixer building by two conveyors, each of which has a capacity of 500 tons an hour. They are 120 feet long, travel 580 feet per minute and are housed over to insure protection against the elements. In the mixer house are two 500-ton mixers operated by two 15 horsepower, form K, induction motors with automatic control.

The unloading, breaking and crushing machinery, and the mixer are connected by an electric signal system which indicates by electrically-operated air whistles, any change in character or mixture of coal being sent through.

Mixer Building.

The mixer building has a storage capacity of 2,000 tons of pulverized coal. In it 80 per cent of Pocahontas and 20 per cent of Ronco coal are mixed, which gives a coke yield of 84 per cent of coal charged. From the mixer house six 500-ton conveyors carry the crushed coal to four cylindrical storage bins over the coke oven batteries. These four bins have a capacity of 2,100 tons each and the six conveyors will completely fill them every 10 hours. The conveyors are driven by two 100-horsepower, two 75-horsepower and two 30-horsepower 3-phase, form K, General Electric induction motors. It is unnecessary to run the coal handling plant at night, due to its capacity and that of the storage bins.

Coke Making.

Larry cars run under the storage bins and over the tops of the coke ovens, into each of which they charge 12¾ tons of coal. The coal is then levelled by a traveling leveller which is operated by four 30-horsepower, General Electric motors. The charging is done in a certain sequence which enables them to always have ovens ready for pushing, thus assuring continuous operation of men and equipment.

The ovens are charged by larry cars, coal being dropped into the ovens through the charging holes on top. Coking requires 18 hours. When the entire plant is in operation, 9,520 tons of coal will be coked in 24 hours, yielding 8,000 tons of coke per day.

The advantages of the type of oven selected for the Gary plant are numerous. The ovens are heated with gas evolved from the coal carbonized. The coal yields from 50 to 60 per cent more gas than the quantity necessary for its carbonization, and in the old bee-hive process of coking this surplus gas is wasted.

A further advantage is that it is not neecessary that the gas be consumed as speedily as it is produced, because it can be conveyed any distance without materially deteriorating, while it can be stored during the time it is not required and consumed during the working hours of the day.

Regenerators also serve as a store for heat by means of which a whole battery of ovens can be shut down entirely for a week or so and started again without any heating up being necessary. This is not possible where regenerators are not used. The regenerators also enable the ovens to be worked at less than one-quarter of their capacity without going cold.

Construction of the Ovens.

The oven chambers are approximately 39 feet long, 9 feet 10⅜ inches high, and from 17 to 21 inches wide and have doors at either end operat-

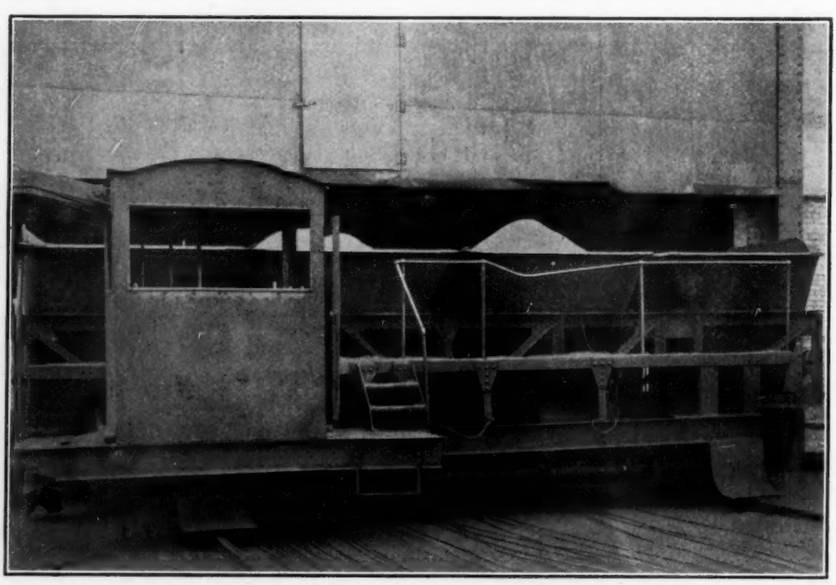


FIG. 3—LARRY CAR RECEIVING CRUSHED COAL FROM OVERHEAD STORAGE BINS AND DELIVERING IT INTO COKE OVENS THROUGH CHARGING HOLES ON TOP OF THE LATTER

ed by a traveling door machine on the coke discharge side and a door machine attached to the coke pusher, at the other side. The top of the oven is provided with openings for charging the coal and an opening through which the gases of distillation are drawn off to the condensing plant.

The air for combustion flows along the passages *A*, Fig. 10, at the front and back of the ovens, and thence it passes into the regenerators through inlets, *B*. In the regenerators, the temperature of the air rises to 1,200 degrees Cent. The highly heated air passes out of the regenerators into the vertical heating flues through the openings, *C*. The gas from the by-product plant, freed from tar and ammonia, is returned to the ovens by the mains, *D*, running along the whole length of the ovens on each side. Branch supply pipes, *H*, conduct the gas into the gas-distributing channels, *E*, which are situated directly beneath the oven walls; thence it passes through the gas nozzles, *F*, into each vertical flue, where it ignites with the hot air entering through the passage, *C*. A jet is, therefore, formed on a level with the oven floor in each of the heating flues in the oven walls.

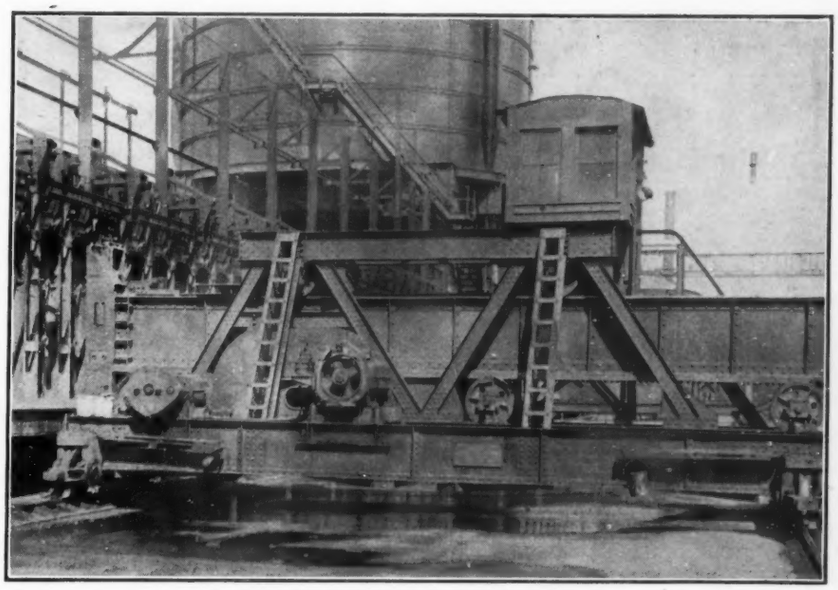


FIG. 5—MOTOR-OPERATED TRAVELING COKE PUSHER AT THE PLANT OF THE INDIANA STEEL CO., GARY, IND.

Regenerators.

The employment of regenerators renders it necessary to reverse the heating process after a period of time, usually about 30 minutes. This is done automatically by a General Electric motor-operated dial switch system which controls the gas and air valves. The system of heating flues are divided into two sections, so that combustion can take place alternately in each half of the oven wall. When the gas is burning in the flue in one-half of the length of the wall, the products of combustion pass up the flues and enter the top horizontal flue, *G*, whence they make their way down the flues in the other half of the oven wall, and enter the regenerator through the same passages, *C*, by which the air is admitted to the flues when the direction of combustion is reversed. On issuing from the regenerator, the waste gases pass into the flue leading to the chimney, *I*, after having given up their heat to the checkerwork of fire brick.

The products of combustion of the gas and air pass up the heating flues, *J*, and through the openings, *K*, at the top of each flue. These openings are furnished with dampers, *L*, which can be easily regulated together with dampers in the regenerating passages, so as to enable the exact amount of air to enter the flue necessary to effect perfect combustion. The sliding bricks are accessible from the top of the ovens through the openings, *M* and *N*, which are fitted with easily removable plugs.

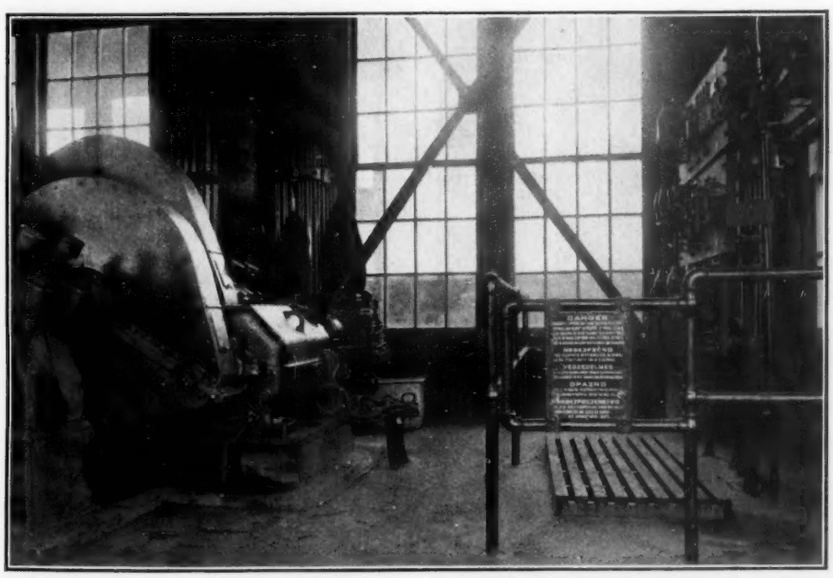


FIG. 4—THE 30-HORSEPOWER MOTORS AND AUTOMATIC CONTROL EQUIPMENT OPERATING HOISTS FOR THE QUENCHED COKE

Regulation of Dampers.

At this point, particular attention should be directed to the sliding bricks and to the openings at the top of the ovens which give access to them. These openings serve not only to provide means for regulating the dampers, but serve more particularly to give access to the gas nozzles, *F*, and they further permit of the flues being inspected at any time. The gas nozzles are furnished with oval orifices, to enable them to be taken out by a rod having a tee end. The orifices in the nozzles vary in size, according to their position in the flues. The removal and replacing of a nozzle can be easily effected in a few minutes.

It happens from time to time in all ovens that dark places appear in the oven walls, indicating that the combustion is defective; and in the absence of means of access to the flues, it would be necessary to cool down the oven and break into the walls in order to remedy the defect. By means of the openings over each flue in the Koppers' ovens, the cause of any irregularity in the heating can be immediately detected, and in the great majority of cases, such defect

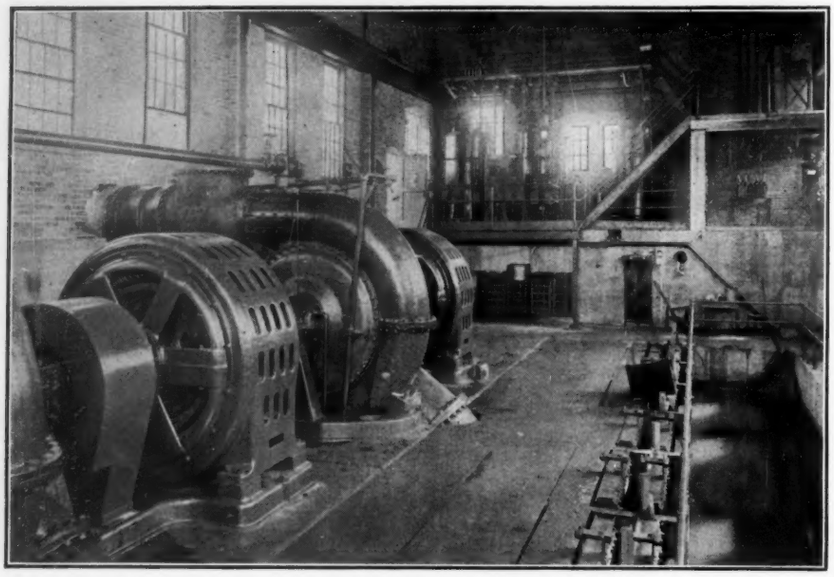


FIG. 6—THE INTERIOR OF THE PUMP HOUSE

could be rectified in a few moments. The effect of any adjustment in the regulation of the gas and air can, moreover, be seen immediately.

Vertical Flues.

It will be noted that each oven wall is formed of about 30 vertical flues, and that each of these flues is provided with a heating jet, and also with means for regulating the admission of the gas and air, namely, by substituting the gas nozzles, and by adjusting the sliding bricks over each flue, respectively. It is, therefore, obvious that it is easily possible to control the heating so that the oven walls will be subjected to exactly the same temperature from end to end. This uniformity in the heating, characteristic of the Koppers' ovens, has been striven after by coke oven builders for many years.

When coking is complete, and the gas fully given off, the doors are removed and the charge is pushed out by the traveling ram which is operated by two 50-horsepower and one 7-horsepower (on door opener) General Electric motors. While being pushed, the coke is partly quenched by water sprinklers, as it falls into a steel and cast iron car to which is attached a 3-phase General Electric locomotive equipped with two 50-horsepower, type MI motors. As soon as a charge is entirely in the car, it is rushed to the shower hood, where quenching is completed.

The coke is then elevated to storage bins by two automatically controlled 30-horsepower, 3-phase motors which operate the elevators. In the final process, the coke is run through screens operated by two 30-horsepower motors of the same type. Each two batteries of ovens are equipped with grinding pans and clay elevators for preparing luting material for the oven doors. These are operated by 15-horsepower, 3-phase induction motors.

Oven Gases.

The gases from the ovens pass through divided water-sealed mains, to coolers of the multi-tubular water tube type, and after passing around the tubes, they leave at a temperature of about 30 degrees Cent.

The gas is then drawn by exhausters which are driven by 250-horsepower General Electric induction motors controlled to give constant gas suction, and delivered to the tar extractors. The tar and ammoniacal liquor which condense here are run off along with the condensation from the coolers and separated by gravity in the tar separating tank.

From the tar extractors, the gas passes to reheaters, where its temperature is raised to about 70 degrees Cent., by the use of steam. The heated gas is then conducted to the acid saturators, lead lined vessels, containing a solution of about 5 per cent of free sulphuric acid, and the gas leaves the saturators at about 30

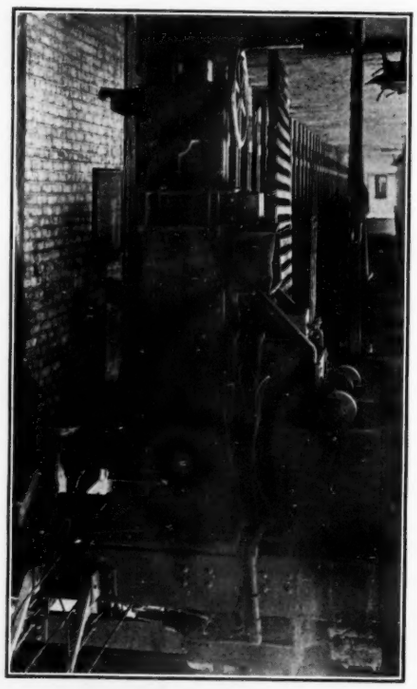


FIG. 8—THE MOTOR-DRIVEN DOOR EXTRACTOR ON THE DISCHARGE SIDE OF THE COKE OVENS

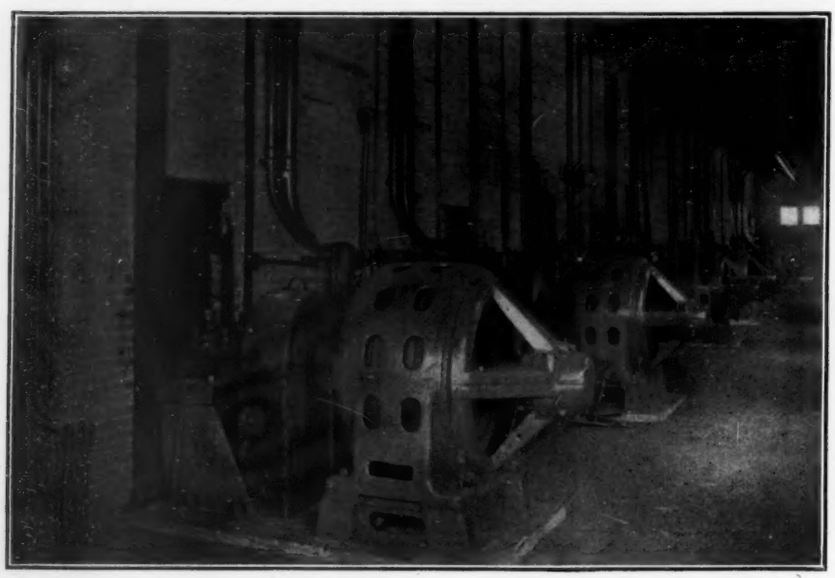


FIG. 7—THE 250-HORSEPOWER SQUIRREL CAGE MOTORS DRIVING HAMMER MILLS

degrees Cent. At this low temperature the chemical affinity between the acid and the ammonia is so great that a neutral salt, ammonium sulphate, is easily obtained. The salt is continuously removed from this enclosed type of saturator by an ejector and delivered into a draining table from which it is run off, together with the mother liquor, in a centrifugal dryer. When desired, concentrated ammonia liquor is produced instead of ammonium sulphate.

Utilization of the Gas.

About 50 per cent of the total daily yield of about 100,000,000 cubic feet of gas is used at the steel plant of the Indiana Steel Co., and about 50 per cent is used to heat the coke ovens. The ammoniacal liquor is treated with lime to decompose fixed ammonia compounds and then heated to vaporize the ammonia, which is conducted to the gas main and is absorbed in the saturators. About 1 per cent ammonium sulphate and 2 per cent of tar is obtained. The coke yield is approximately 84 per cent of the weight of the coal coked. This greatest of all coke plants is supplied with 60,000,000 gallons of water a day by two centrifugal pumps operated by 1,300-horsepower 3-phase, form M, General Electric motors.

Gas Engine Economies

In his presidential address before the West of Scotland Iron and Steel Institute, W. Dixon stated that a gas engine working on blast furnace gas will develop not less than twice the power that could be generated by steam engines using gas-fired boilers. The rapid increase in the number of gas engines employed on blast furnace gases shows to what extent their possibilities have been recognized, and their distribution shows that Great Britain is much slower than other countries in awaking to this fact. The comparative distribution of large gas engine units among the various countries follows: Germany, 46.5 per cent; United States, 32.5 per cent; France, 5.4 per cent; Belgium, 4.6 per cent; Austria-Hungary, 2.4 per cent; Great Britain, 2.4 per cent, and other countries, 6.2 per cent. The use of large gas engines for power generation effects economies even when blast furnace gas is not available. When used in conjunction with gas producers coupled with ammonia recovery and by-product plants, the recovery of sulphate of ammonia is frequently equal to the gross value of the original cost of the fuel consumed.

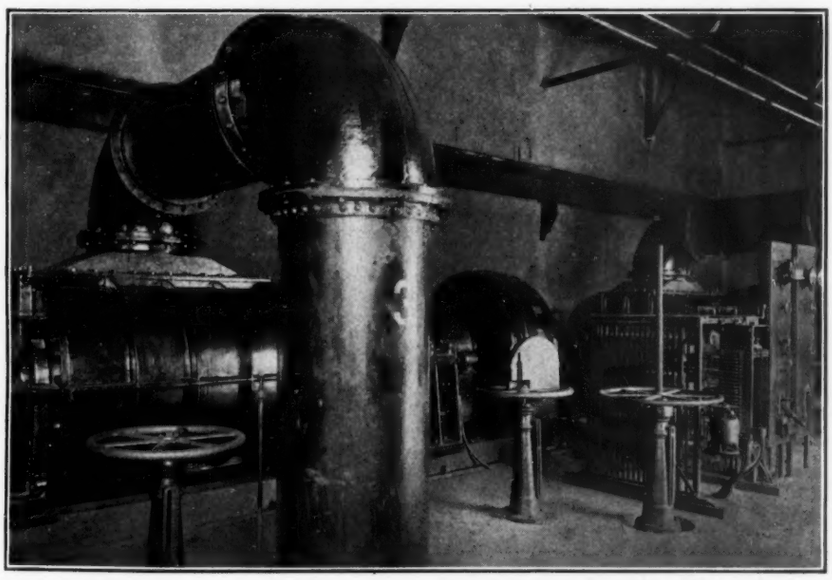


FIG. 9—GAS EXHAUSTERS OPERATED BY 250-HORSEPOWER MOTORS

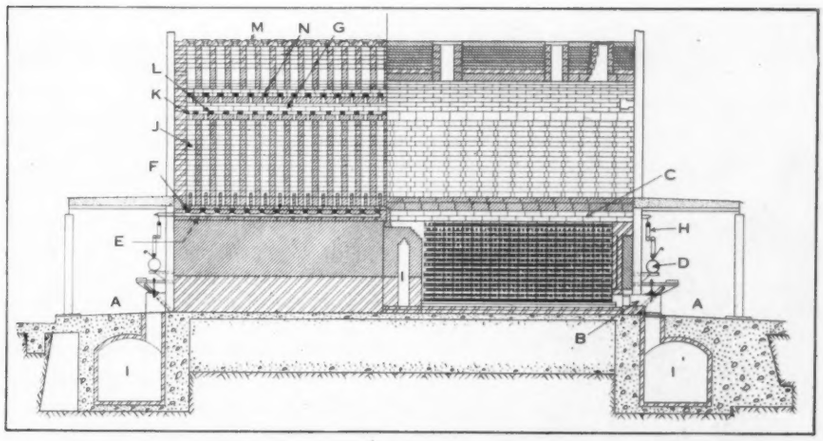


FIG. 10—LONGITUDINAL SECTION THROUGH THE OVENS AND HEATING FLUES

American Rolling Mill Co.'s Plant Visited

On Dec. 8 the officers of the American Rolling Mill Co. entertained the members of the National Corrugated Culvert Association at their works, Middletown, O., following the annual convention of this association in Chicago. The delegates were taken to Middletown in special cars and were escorted through both the central and the large new east side works. After the inspection of the works a banquet was tendered the delegates by the American Rolling Mill Co., which was held at the Elks' Temple. Toasts were responded to by John S. Beall, president, and Ray Frazer, secretary of the National Corrugated Culvert Association, R. C. Phillips, secretary, and G. H. Charls, assistant secretary of the American Rolling Mill Co. The manufacturers who compose this association produce approximately 80 per cent of all the metal culverts manufactured in the United States.

Maurice Goedman, 32 Broadway, New York City, is American representative for the Chatillon, Commentry & Neuves-Maisons Steel Corporation, Paris, France. This concern has made a specialty of steel required in the construction of automobiles and Mr. Goedman is offering several brands designed especially for forgings, gears, bearings, shafts, cams, etc.

The estate of P. D. Beckwith, Dowagiac, Mich., owning and operating the Round Oak Stove Works, sustained a considerable loss by fire Dec. 10. The manufacturing departments escaped, but heavy damage was done to the office, display and shipping rooms.

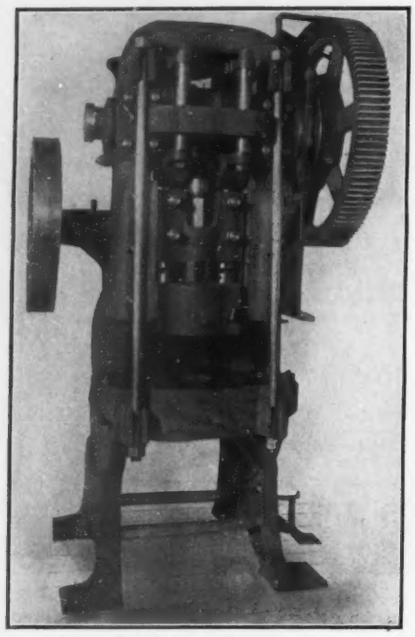


FIG. 1—FRONT VIEW OF DOUBLE-ACTING CAM PRESS

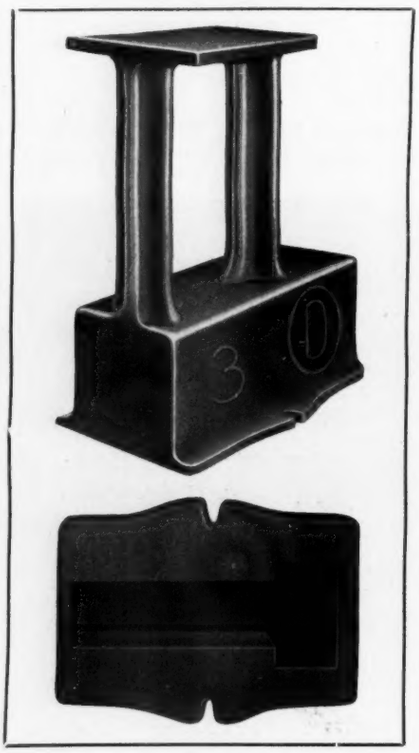
Double-Acting Cam Press

A new type of a double-acting cam press has been added to the extensive line of power presses built by the Standard Machinery Co., Providence, R. I. This design is adapted for deep drawing of light and medium gage metals at a single stroke, and to produce the maximum draw at one stroke. The machine, Figs. 1 and 2, is equipped with an extra heavy drop forged crank shaft with tool steel cams forced over the wings of the shaft outside of the upper connection of the drawing ram. The diameter of the wrist pin on the drawing ram is 3½ inches; the bore of the cams is 7⅛ inches and the length, 4⅜ inches with an actual bearing surface of 3 inches. The maximum radius of the cam is 7 1-16 inches and the minimum, 4 1-16 inches, which allows a throw on the blanking ram of 3 inches. This is a large throw for a blanking ram of a cam press and the object is to permit of the production at a single stroke of a piece over 3 inches high without raising the die. The drawing stroke is 7 inches and the machine is so arranged that the blanking and drawing ram leave on the up-stroke at the same time.

The press is equipped with capped boxes which permit the shaft to be taken out readily. The yokes are of steel. The four screws on the blanking ram are set in elliptical holes with bushings bearing against the shanks of the lower yokes. The upper yokes are of forged steel and are connected by steel pins relieved on the inside for cam clearance. The supporting straps on the back and front of the press are babbitted for the purpose of securing perfect running surfaces for the yoke pins. The inside plunger is of forged steel and moves in the blanking plunger through a bronze sleeve. This press is furnished either with a balance wheel or tight and loose pulley drive and with hand or foot trip and roll or dial feed. The dimensions of the press follow: Weight, 9,500 pounds; fly wheel, 30 inches in diameter; stroke of cutting slide, 3 inches; stroke of drawing plunger, 7 inches; distance between uprights, 19 inches; length of bed, 28¼ inches; width of bed, 19 inches; speed of press, 225 revolutions per minute, and height over all, 7 feet 10 inches.

A New Concrete Hanger

A new type of hanger for use in concrete structures manufactured by the Dayton Malleable Iron Co., Dayton, O., is shown in the accompanying illustration. The hanger is made in one piece from high grade malleable iron and may be adjusted within a range of from one to three inches to counteract any slight errors in setting. They are nailed to the forms, the broad base effectually preventing the displacement of the hanger or tilting while the concrete is being poured. Where heavier weights are to be suspended, or a greater amount of adjustment is desirable, these hangers may be used up to 36 inches in length. For light service where no adjustment is required, a lighter hanger is manufactured, which is provided with standard size bolts. These hangers are recommended for use in ceilings, walls and columns of concrete buildings, and especially for use in securing heavy machinery to concrete floors.



MALLEABLE IRON HANGER FOR CONCRETE CONSTRUCTION

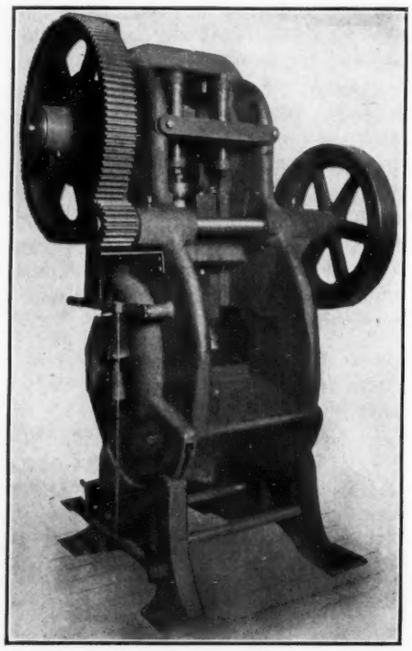


FIG. 2—REAR VIEW OF DOUBLE-ACTING CAM PRESS

Spain's Iron Trade

The iron and steel imports into Spain during the first nine months of 1911, were as follows: Pig iron, 3,998 tons, an increase of 173 tons over the corresponding period last year; castings, 3,764 tons, an increase of 1,430 tons; bars, shapes and plates, 20,164 tons, a decrease of 498 tons; tin plate, 1,119 tons, an increase of 299 tons. The coke imports totalled 234,771 tons against 213,798 tons in the same period in 1910. The exports of iron ore and iron and steel products during the same period follow: Iron ore, 5,640,791 tons, a decrease of 681,487 tons; iron pyrites, 2,043,820 tons, an increase of 6,881 tons; manganese ore, 24,300 tons, an increase of 19,670 tons; pig iron, 29,553 tons, an increase of 3,858 tons; manufactured iron, 1,449 tons, a decrease of 7,779 tons over the corresponding period of 1910.

The Power Requirements of a Steel Tube Mill[1]

A Description of the Electrical Equipment Used for Driving Tube Mills, With a Discussion of the Power Economies Effected

By A. S. Ahrens

In the last few years remarkable progress has been made in the application of electric power to rolling mills, including both the main and auxiliary drives. There are now installed over 175,000 horsepower in large motors driving the main rolls, and over 600,000 horsepower in smaller motors on tables, shears, etc. This progress has been general, and electric drive is now being considered for practically every type of mill. Among these, tube or pipe mills occupy a prominent place. In the tube mills, especially those using the welding process, progress has been very rapid and there are several mills of this kind entirely motor-driven, steam finding a place only in the generating station.

First Electrically-Driven Tube Mill.

One of the first tube mills to adopt electric drive was that of the Spang-Chalfant & Co., Pittsburgh. At this plant small tubes are made by the butt-welding and large tubes by the lap-welding process. Unless otherwise stated, the descriptions and illustrations here given cover the making of 18-inch pipe by the lap-welding process, and ¾ inch pipe by the butt-welding process.

[1]From *The Electric Journal*, December, 1911.

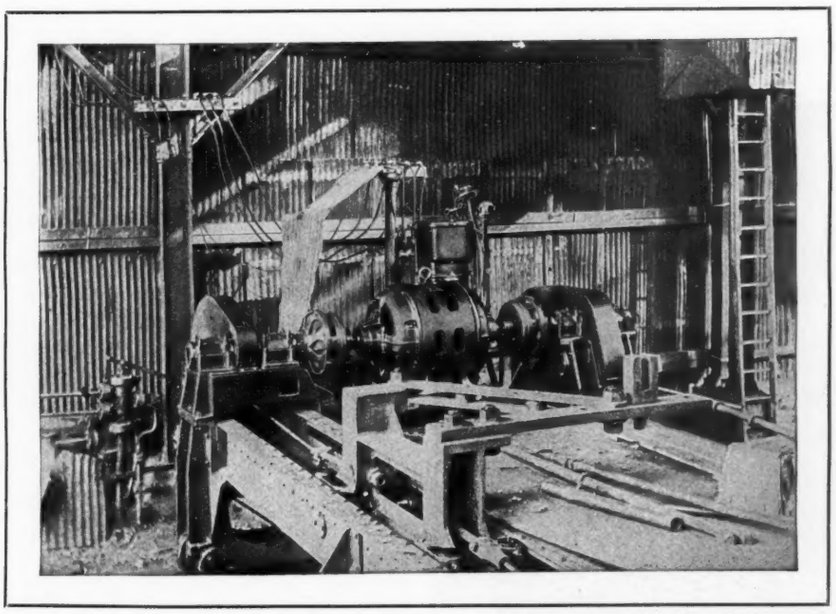


FIG. 1—A 20-HORSEPOWER, 875 R. P. M. MOTOR DRIVING CHARGING BUGGY OF BENDING ROLL FURNACE

The stock from which the pipes are made consists of rolled steel plates of suitable length and width, called skelp. The travel of the material, through the different processes, from the skelp to the finished pipe, cut off to exact length and threaded, is shown diagrammatically in Fig. 5.

The service requirements of motors for this kind of work are exceptionally severe. Many of the motors must operate in close proximity to the furnaces, and hence are subjected to high temperatures. The passage of the metal through the rolls must be continuous, as, if a pipe gets stuck, a considerable delay may result. For this reason no circuit breakers or fuses are provided, and motors are chosen of rugged mechanical structure and large torque, and are expected to continue in operation in spite of adverse circumstances. The heating effect of the load, in most cases, need not be considered, as it is very intermittent in character and as the mills usually are rolling pipe of a smaller size than the maximum for which the motors are selected. On the other hand, the possible high initial temperature of the motors must be considered in determining the allowable temperature rise.

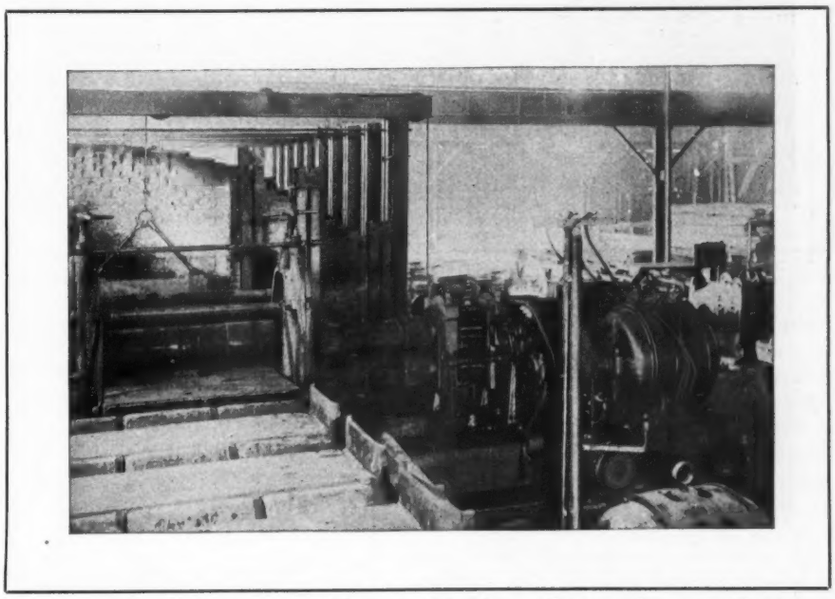


FIG. 2—A 50-HORSEPOWER, 575 R. P. M. MOTOR, DRIVING SCARFING ROLLS

Severe Operating Conditions.

On account of the severe operating conditions, excessive heat and large amount of dust and dirt, induction motors with squirrel cage secondaries are used almost exclusively. Practically all of the motors drive through large gear reductions, and in the ma-

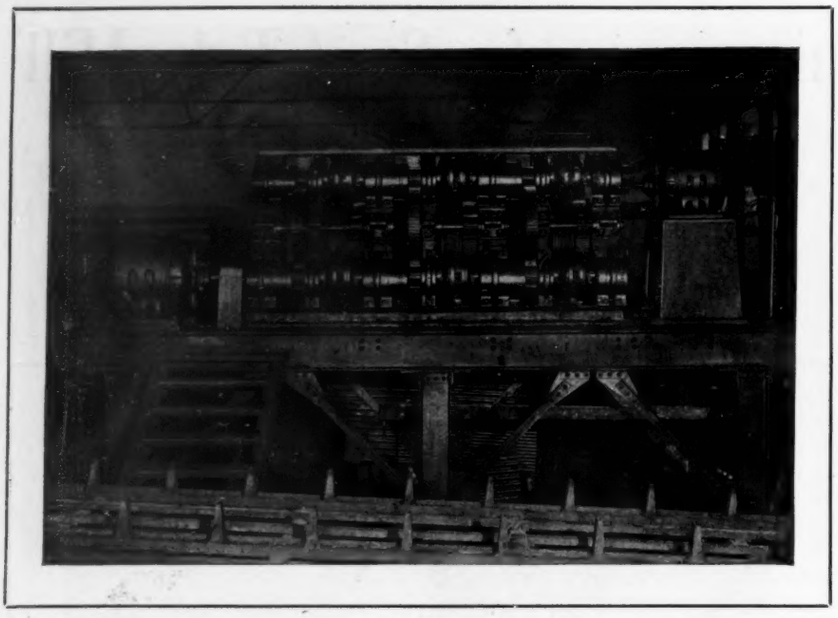


FIG. 3—75-HORSEPOWER, 850 R. P. M. MOTORS, DRIVING WELDING FURNACE PUSHER

jority of cases they run continuously in one direction, the operation and reversing of the rolls being accomplished by means of clutches. Although the load is of a very intermittent character in most instances, the peaks are nearly always of too great duration to allow the satisfactory use of fly wheels.

The charging buggy, shown in Fig. 1, illustrates an application of a non-reversing motor to a drive which must be reversed from 100 to 150 times an hour. The frequent reversing of large motors is, of course, objectionable both on account of the strains on the motor and on account of the heavy rushes of current in the transmission system. In the Spang-Chalfant plant this motor is of the mill type construction, with a squirrel cage rotor, and runs continuously in one direction. It has a double shaft extension, each end being connected through an induction clutch and a set of gears to the drum which drives the cables. Thus, for the operation of the buggy in the forward direction, one clutch is energized, while for reversing, the second clutch is used. On account of the use of induction clutches, with the motor in continuous operation, the load is picked up very gradually without excessive peaks.

Motor on Scarfing Rolls.

The motor on the scarfing rolls, Fig. 2, also operates continuously in one direction, there being no occasion for reversing the rolls. During the time between passes, which, as shown by the curves, Fig. 6, averages about 4½ minutes, the motor operates under a friction load of about 50 per cent of full load. The load period, while a plate is passing through the rolls, lasts about 10 seconds. The power required varies with each piece, depending on how near to exact width the skelp is. The power also varies with the size of the skelp, the curve in Fig. 6 being taken while skelp for 18-inch pipe was being scarfed, the capacity of the mill being 24-inch pipe. Although the load on this motor is very intermittent and the peak load occurs for only 4 per cent of the total time, a fly wheel cannot be used to advantage as the time required for the skelp to pass through the rolls is too long. The motor must, therefore, be depended upon to pull the piece through the rolls under all conditions. Reference to Fig. 2 shows that this motor must operate in very close proximity to the furnace, and to the heated skelp.

It is possible, especially for pipes of small or medium size, to scarf the skelp in special motor-operated scarfing shears, although this method is

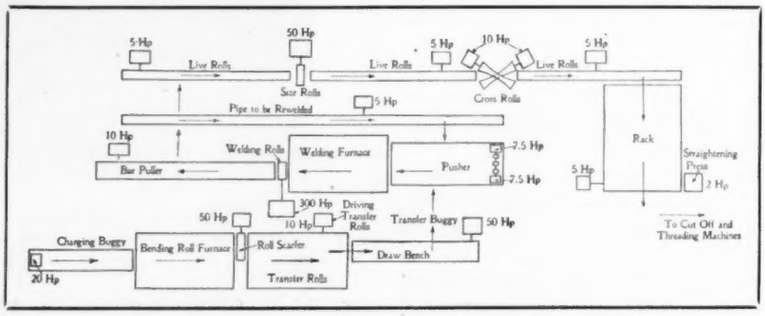


FIG. 5—DIAGRAM OF A TYPICAL LAP-WELD TUBE MILL

FIG. 4—A LAP-WELD FURNACE, SHOWING THE BENT PLATE READY TO CHARGE

not common. In this case also the load is very intermittent in character, the power load occupying about 45 per cent of the total time of operation. The actual amount of power at the peaks depends entirely on the amount of metal removed, and is independent of the size of pipe being made.

After leaving the scarfing rolls, the skelp is carried forward on the transfer rolls, shown in the left foreground, Fig. 2, to the draw bench. Here it is attached to an endless chain by means of mechanical tongs or jaws and is pulled through the bender on the draw bench, where it is formed in a die around a mandrel into circular shape, with the edges overlapping but not closed. The motor and the chain operate continuously, the friction load being equal to about 15 per cent of full load. About eight seconds are required for the bending operation. The pipe is then rolled down an incline to the transfer buggy in front of the welding furnace.

The transfer buggy is a motor-operated truck, carrying a trough to receive the pipes from the draw bench, and hold them while the truck is moved back and forth in front of the welding furnace, under the welding furnace pushers. It is driven by a 5-horsepower direct current mill type motor, which is equipped with a solenoid-operated stop brake in series with the motor. The buggy is in continual operation, it being estimated that the brake is set over 1,000 times per hour.

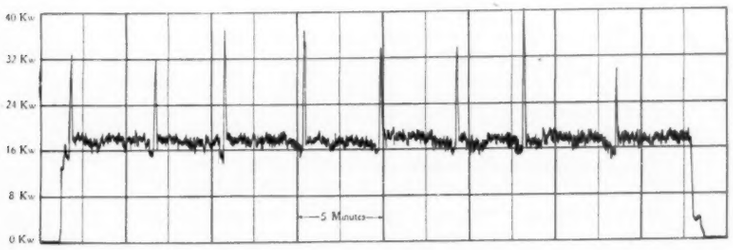


FIG. 6—GRAPHIC METER RECORD OF MOTOR DRIVING SCARFING ROLLS

The pushers feeding the pipe into the welding furnace present an application essentially similar to the charging buggy in that induction clutches are used to allow a non-reversing motor to be used for service which requires frequent reversing. The application has been worked out to greater detail, however, as shown in Fig. 3. The pusher consists of three endless cables, revolving on drums. From each cable is suspended a framework, having a holder, in which one end of a steel bar is placed, the other end engaging the pipe while it is still in the transfer buggy. The drums which drive the cables are mounted on a shaft which is in turn geared to two shafts revolving in opposite directions, each driven by a motor. By means of the clutches any drum can be driven in any direction, only one drum being operated at a time.

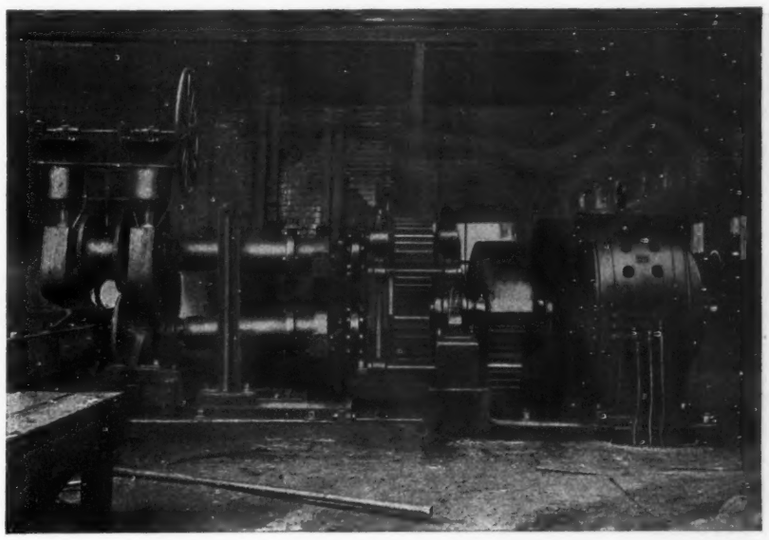


FIG. 7—A 300-HORSEPOWER, 450 R. P. M. MOTOR, DRIVING WELDING ROLLS

The pipe, which is still at a red heat from the bending operation, is brought to a welding temperature in a furnace of the Siemens regenerative type. It is then pushed from the furnace in a suitable position to enter the welding rolls, being directed by troughs in the floor of the furnace.

A view of the welding rolls from the end opposite the furnace, is shown in Fig. 7. A 300-horsepower,

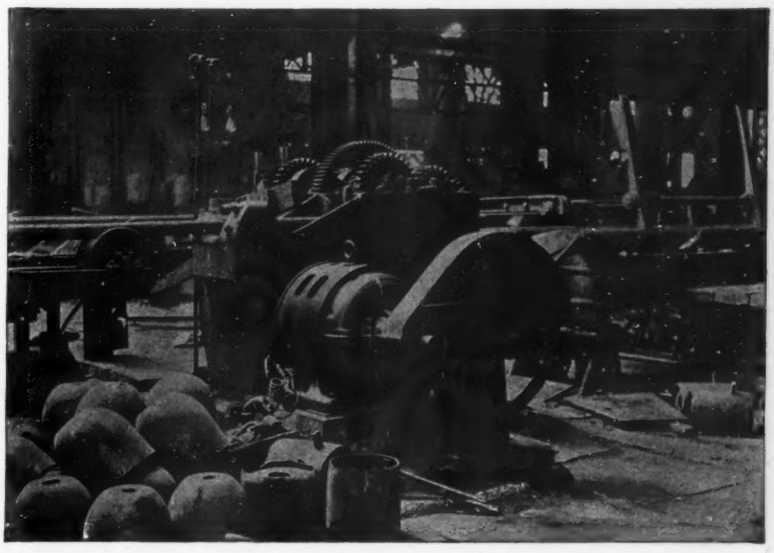


FIG. 8—A 10-HORSEPOWER, 850 R. P. M. MOTOR, DRIVING BAR PULLER

FIG. 9—TEN-HORSEPOWER, 950 R. P. M. MOTORS, DRIVING LIVE ROLLS

450 revolutions per minute motor is geared to the rolls, with a large fly wheel connected to the main gear, as shown in Fig. 18. By mounting the fly wheel in this manner, it operates at a much higher speed than if connected directly to the rolls and a much smaller wheel can be used to produce the same fly wheel effect. The distance between the bending and welding furnaces is very small in this plant, making it impossible to mount the fly wheel between the gears and the motor.

The pipe is in the rolls about three seconds, during which time the load on the motor is increased, as shown in Fig. 11, to six times the friction load. At the time the curve was taken about 18 pipes were being welded per hour or one in 3½ minutes. The peak load is on the motor about 1-70 of the cycle. It will be seen, therefore, that this duty is of the most intermittent kind, and that the motor must be selected for its ability to stand the momentary overload rather than for its continuous capacity. From the standpoint of production also, the momentary overload capacity of the motor is given important consideration. If a pipe sticks and becomes cold, valuable time is lost in releasing it from the mill and this must be avoided if at all possible. There are no protective devices in the circuits, and a motor is installed large enough to pull the pipe through under practically any conditions. This fact accounts for the comparatively low average load shown by some of the curves. It should be noted, also, that the welding roll motor, as well as several others, is situated very near the furnace, which makes it necessary to give the capacity of the motor special consideration; the temperature of the surrounding air is over 100 degrees Fahr. even in winter.

The bar puller, shown in Fig. 8, consists of small revolving rolls, which grip the bar and pull it one way or the other, the reversing being done by a mechanical clutch. The load produced is very irregular, as shown by the curve in Fig. 12. The peaks occur when the bar is being run to the rolls, and again when the bar is returned.

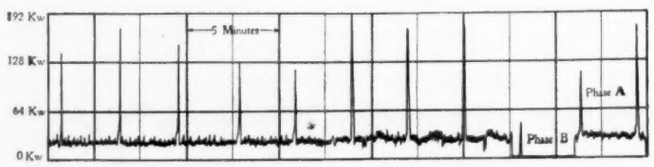


FIG. 11—GRAPHIC METER RECORD OF MOTOR ON WELDING ROLLS

FIG. 10—A 50-HORSEPOWER, 590 R. P. M. MOTOR, DRIVING SIZING ROLLS

The pipe is lifted from the racks in front of the welding furnace by a set of hydraulically-operated levers, shown at the extreme right in Fig. 8. If inspection shows that the weld is perfect, the pipe is rolled down an incline to the live rolls feeding the size rolls. If the weld is not perfect, the pipe is raised on an hydraulically-operated turn-table, and turned end for end before returning to the welding furnace. This gives a back lap which produces a more perfect weld than would be possible with two rollings in the same direction.

After welding, the pipe, still white hot, is run through the size rolls, which reduce it to correct external size, and then through the cross rolls where, with a whirling motion, it is straightened. It is conveyed to the size rolls by the live rolls, Fig. 9. To insure accurate sizing, the pipes are usually passed through the rolls three times, the reversing of the

rolls being accomplished by means of a clutch. This operation also requires the reversing of the live rolls, which is done by reversing the motors, thus producing a very peaked load on the motors. As shown in Fig. 20, the load on the sizing rolls is similar to that at the welding rolls, though the peaks are not so severe. Due to the greater duration of the peaks, a fly wheel would be of no assistance in smoothing out the load curve. For this application a motor with a large starting torque and liberal over-load capacity is required. The cross rolls are driven through a double reduction gear by a separate motor for each roll. To insure simultaneous operation, both motors are controlled from the same switch, no starting box being necessary.

A number of very interesting features may be brought out by an analysis of the power curve for these motors, shown in Fig. 19. It will be noticed that the power on the motor drops off for an instant as the pipes enter the rolls, and then rises to the full load value. This is probably due to the fact that the velocity of the pipes along the live rolls is greater than their linear velocity through the cross rolls. Thus the pressure on the gears is temporarily relieved, until the motor catches up in speed. The succeeding peaks are caused by the inertia of the pipe as the rotary motion is started, and by reversing the motors while the pipe is in the rolls, which occurs twice with each pipe. During the time that this curve was taken, one of the pipes got stuck in the rolls. This is a condition which is liable to occur at any time, and which the motor must be able to handle. In this particular case, the sticking was not caused by any fault in the pipe, but occurred because the power was thrown off temporarily. When the power came on the lines again, the motors started up with the pipe in the rolls, requiring very heavy starting current. The power was well within the capacity of the motor, however, in this particular case, as the pipe was only 4 inches in diameter, while the capacity of the rolls is 8-inch pipe.

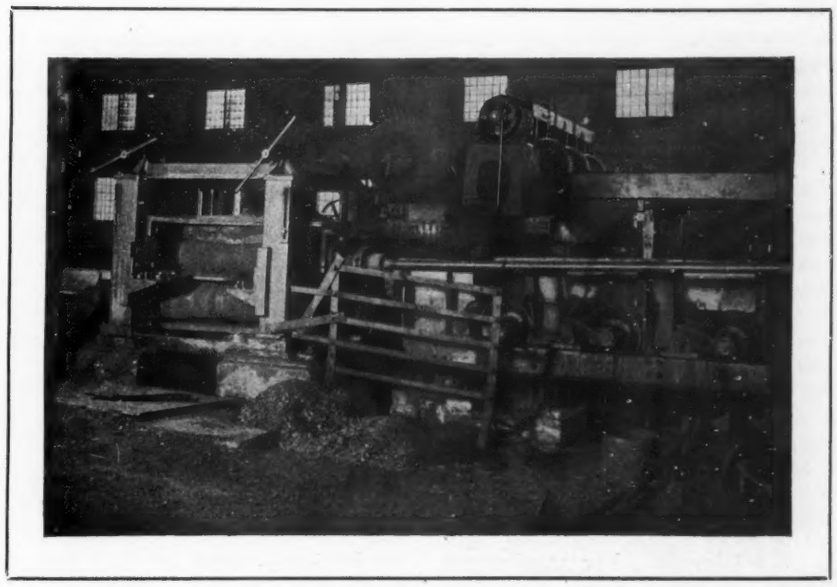


FIG. 13—CROSS ROLLS DRIVEN BY 10-HORSEPOWER, 850 R. P. M. MOTORS

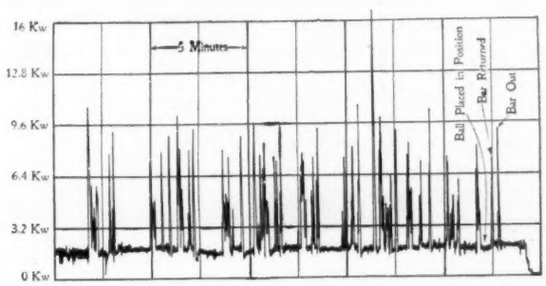


FIG. 12—GRAPHIC RECORD OF MOTOR, DRIVING BAR PULLER

After the pipe has passed through the cross rolls, it has the correct inside and outside diameter, and is approximately straight. It is then run out on the racks and allowed to cool. Before being cut off to standard length and threaded, the pipe is passed through a straightening machine of the press type, with a fly wheel mounted on the cam shaft. Two cylindrical dies, about 12 inches in length and of the same diameter as the pipe, are pressed firmly around the pipe every 6 to 12 inches of its length, removing all inequalities.

The pipe cutting-off and threading machine represents a final application which requires the most rugged characteristics on the part of the mo-

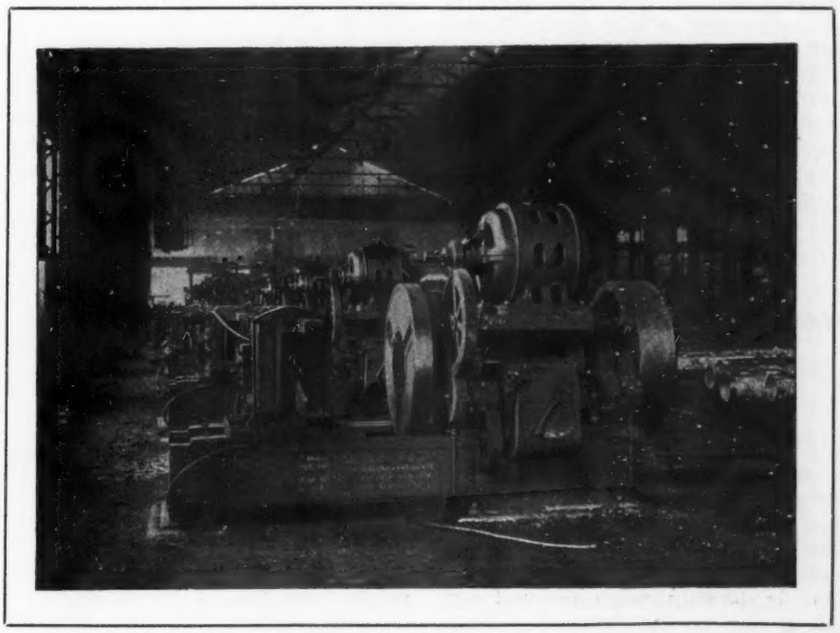


FIG. 14—TEN-HORSEPOWER, 590 R. P. M. MOTORS, DRIVING PIPE THREADER AND CUTTING-OFF MACHINES

tor. The record shown by the curve in Fig. 15 was taken while cutting 18-inch tubes at an average cutting speed of 38 feet per minute. The average load on the motor while cutting is shown by the curve to be about 6 kilowatts. The starting conditions are exceptionally severe, however, as the motor is started simply by closing a switch. The motor was reversed for the reaming operation while running, causing a very heavy peak, and was again reversed to set the machine for the next pipe. This manipulation is, of course, very severe on the motor windings, and on the gearing.

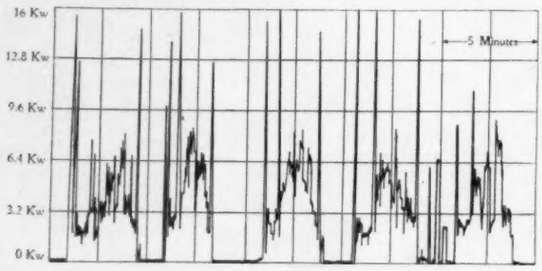


FIG. 15—GRAPHIC RECORD OF MOTOR, DRIVING PIPE CUTTING-OFF MACHINES

Butt-Welding.

All pipe over 3 inches in diameter is made by the lap-welding process as described. With smaller pipe it is possible to combine several of the operations into one by butt-welding the joints. The diagram of a butt-weld mill, Fig. 16, shows the greater simplicity of this arrangement. The front corners of the skelp are cut off with the shears before it is placed in the furnace, to assist in starting it through the mandrel. In place of being heated twice, the skelp in the butt-welding process is brought at once to a welding temperature, and the bending and welding are accomplished in one operation. The forward end is grasped by a tong grip which is attached to a traveling chain and is drawn through the bell very much as in the lap-weld bending process. The difference consists in the fact that the mandrel is so shaped that the edges of the skelp are forced together under considerable pressure, causing them to weld. No ball is used, as with small sizes of pipe it is unnecessary.

The power requirements for a motor for butt-welding are very similar to those for the draw bench in the lap-weld bending process, in that the motor operates continuously in one direction. No fly wheel is used, because, as shown in the power curve, Fig. 17, the interval between peaks is hardly sufficient at times to allow a fly wheel to regain its speed. For this reason, and also because of the fact that a delay caused by lack of sufficient power to pull the pipe through the bell is liable to become very costly, the motor must be selected of ample overload capacity, and with very large starting torque.

After welding, the pipes are run through sizing and cross rolls, and cut off to size and threaded the same as the lap-welded pipes.

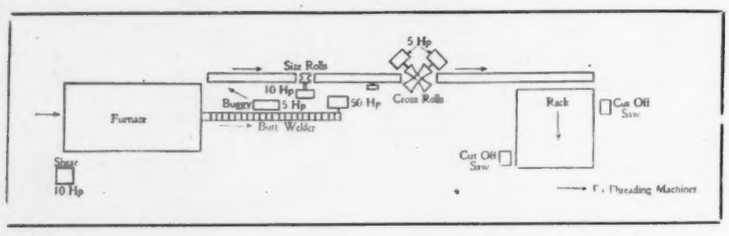


FIG. 16—DIAGRAM OF A TYPICAL BUTT-WELD TUBE MILL

Owing to the large capital investments and high labor costs it is absolutely essential in the manufacture of steel products that work proceed with the greatest possible continuity. No interruptions are tolerated that can possibly be avoided. The service is very severe, and in the majority of cases is continuous 24 hours per day. However, electric motors have demonstrated their ability to meet these conditions. In the case of the above plant, the motors have been operating almost continuously since their installation over three years ago. Owing to their rugged and liberal design they have required practically no repairs and no attention, except a regular inspection of bearings, oil, etc. In fact, for two lap-weld mills only three men are required to attend the motors, one being the chief electrician, another his assistant, who is a mechanic, and the third an oiler. These men also attend to the cranes and make any necessary changes in wiring, etc.

One advantage in electric drive, which should not be overlooked, is that by means of graphic meters, installed on the motor circuits, a permanent graphic record can be obtained of the different operations accomplished by the motor-driven machines. In this way, data respecting amount of power, cost of work, efficiency of machines and operators can be obtained as by no other method and changes and improvements made accordingly.

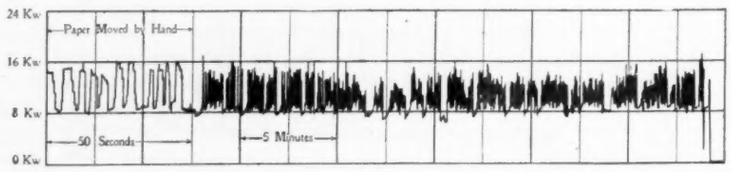


FIG. 17—GRAPHIC RECORD OF MOTOR ON BUTT-WELDER

Small Steel Castings by Converter Process[1]

By Bradley Stonghton

This subject has been already discussed so thoroughly that not many points remain to be covered. One matter, however, which, it seems to me, has not been sufficiently exploited is that of silicon in the pig iron, which varies all the way from 1.50 per cent going into the cupola (equivalent to say 1.25 per cent in the melted pig) up to sometimes as much as 2.50 per cent. No doubt a greater proportion of silicon is required when only a few heats per day are made, as well as when the blowing is slow, and when the metal is retained a long time in the converter, being poured into hand ladles,

[1]Presented at the Pittsburgh convention of the American Foundrymen's Association.

requiring 30 minutes or so per heat. In our opinion, hotter steel and less loss may be obtained by rapid working and lower silicon, not more than 1.75 to 1.50 per cent in the cupola.

Waste of Metal.

Silicon has a treble effect in causing waste of metal:

1.—It is the slag producer of the process. Every unit of silicon present is oxidized, enters the slag and remains there permanently. In this respect silicon differs from iron, manganese and other elements that are oxidized, all of which may be afterwards partly reduced by the carbon and given back to the metal. Side blow converter slags are composed chiefly of silica and oxide of iron with a certain amount of manganese, depending upon the manganese in the pig iron used. It will have been noticed by all those accustomed to have these slags analyzed, that every type of practice automatically produces a slag of a certain analysis in iron. Colder blows may increase the amount of iron in the slag, and vice versa, but as a general thing, the iron content of the slag is approximately uniform, and therefore, the weight of slag will determine the weight of iron lost in it. For example, if a slag normally contains 30 per cent of iron and weighs 10 per cent of the bath, then the amount of iron lost in the slag will be, 30 per cent by 10 per cent equals 3 per cent of the total metal present. If, on the other hand, a slag weighs 15 per cent of the bath, and contains 30 per cent iron, then the corresponding metal loss will be, 30 per cent by 15 per cent equals 4½ per cent. The amount of slag produced is an important cause of waste of iron.

2. — A second source of loss due

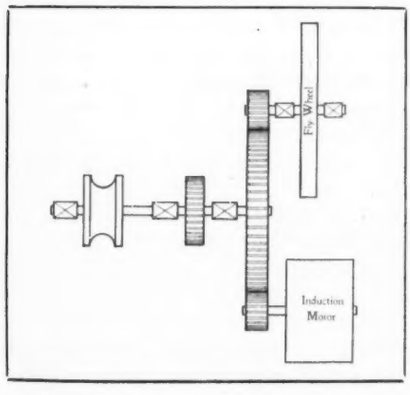


FIG. 18—PLAN OF MOTOR AND FLY WHEELS ON WELDING ROLLS

to silicon is increasing the length of the blow, and especially the interval before the carbon begins to burn. During this interval there is a large amount of brown smoke formed in the converter, all of which represents loss of iron by oxidation and volatilization. The longer this action continues, the greater will naturally be the iron wasted by this means.

3.—Finally, all the silicon introduced with the pig iron is burned up, and this likewise represents a loss of weight.

We are also in favor of rapid working as a cause of hotter steel, lower cost

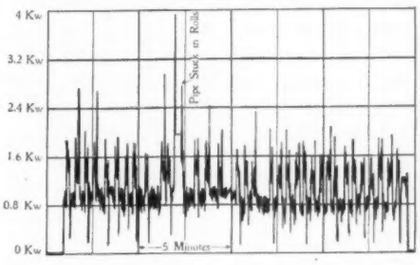


FIG. 19—GRAPHIC RECORD OF MOTOR, DRIVING UPPER ROLL OF THE CROSS ROLLS

for labor, less loss in skulls, etc. It would seem that every plant should aim to produce at least three blows per hour, and at the rate of not less than 12 blows between 1 p. m. and 4:45 p. m.

Success of Converter Plants.

A good deal has been said and written about the many failures of converter steel foundries in this country, which have been all too frequent. The converter process has naturally had to bear the blame for these failures, but we think that the causes lie deeper than the process itself. A converter foundry is almost foredoomed to failure if it attempts to compete in an open market with the open-hearth process in castings averaging over 100 pounds each. The converter cannot hope to make large castings at as low a price as the open-hearth furnace. It can make small castings at a cheaper price than the open-hearth furnace, and can get a better price for them on account of greater freedom from blowholes, and better appearance and detail. This high price is necessary for the success of a converter foundry, however, because an open-hearth foundry will usually underbid the price on small castings for one or both of two reasons:

1.—An open-hearth foundry with large production can afford to lose money on a comparatively small amount of castings for the sake of other business.

2.—Open-hearth foundries, frequently, do not know how much their small castings cost them, because they do not segregate the small castings from the large and estimate separately the percentage of defective castings, which is what runs the price up to such a high figure in open-hearth practice.

In making a comparatively small tonnage of small size castings, the percentage of defective castings in this class may be as high as 20 per cent without this fact becoming evident on the daily or monthly statement, except occasionally by accident.

Insufficient Capital.

Another frequent cause of failure of converter foundries is lack of sufficient capital with which to do business on a business basis. The cost of installation of a converter foundry is so small that many companies rush in with small capital. This has happened so frequently that buyers of steel castings are always ready and prepared to take advantage of the opportunity and they soon learn it when a foundry is in difficulties and is ready to accept work at low prices for the sake of quick cash. More often than not, the final result is failure and abandonment after a few months' struggle, but unfortunately there are usually enough of these tottering companies in the field to keep the market for small castings in a disorganized condition to the serious detriment of the business. This is not real competition and in the end will drain the strength of the industry as a whole.

It would seem that both open-hearth and converter foundries could serve their own interest best by agreeing to divide the field on a logical basis, each process confining itself to the class of casting which it can make to the best advantage. It seems to be now pretty generally admitted that the converter can make small castings of higher quality as regards freedom from blow-holes than the open-hearth furnace, either acid or basic.

We think also that if open-hearth foundries will take the trouble to figure their defective castings in small sizes separate and apart from their general run of castings, they will find the percentage so high that the cost of making them is seen to be greater than if they

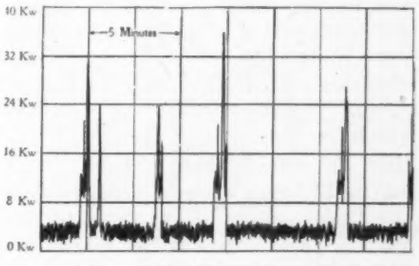


FIG. 20—GRAPHIC RECORD OF MOTOR, DRIVING SIZING ROLLS, SIZING 18-INCH PIPE

put up a converter for the purpose or else sublet the work to a converter foundry. On the other hand, a converter foundry cannot make large size castings so as to compete on a fair basis with the open-hearth process and attempts to do so can hardly serve the lasting advantage of either manager or stockholders.

The Relation of Manual Training to Industry[1]

The Continuation Schools of Germany and the Bearing They Have Had Upon the Advancement of that Nation

Manual training is the keystone by which the growing student is brought over into the field of useful industry. It is the link by which the children of today become parts of the chain which spells progress for the community. It enables a scientific adjustment to environment and tends to industry and growth. It is the broad avenue by which young men and young women may travel to mechanical and vocational success. It is true that manual training by itself could not accomplish all that is desired. It is rather but the beginning, the weeding out process, where the latent talents of the youth are discovered and the boy is prepared to continue his work in the higher school or advanced institution.

German Schools.

Germany is a classical example of a nation that has not neglected the development of its most valuable resources, its young men and young women. For example, in one city there are 40 different kinds of industrial continuation schools—schools for chimney-sweeps, coachmen, hotel and restaurant waiters, jewelers, shoemakers, carpenters, machinists, blacksmiths, tinsmiths, printers, bookbinders, and many others. The name, "continuation school" — *Fortbildungschule* — is chosen advisedly, for every youth who graduates only from an elementary school is obliged by law to continue his education in some such continuation school during the period of his apprenticeship to his trade, and he is sure to find a continuation school appropriate to his vocation. Employers are by law required to give their employes the time to attend these schools, from six to 12 hours a week, depending on the trade, and for from three to five years. These continuation schools are not evening schools, because it is well known that boys from 14 to 15 years of age, are unable, after a hard day's work in a shop or factory, to profit by evening instruction to the same extent as if this instruction were given to them during the day. We have found from experience that after a boy reaches 17 or 18 years of age he is very much more able to carry this night instruction.

In these continuation schools, one of the most suggestive arrangements is the close correlation of the theoretical foundations of each trade with the instruction in the processes of the trade. For instance, the mathematics of the school is the mathematics of the shop, whether the trade is jewelry or shoemaking or carpentry. The same is true of the machinist's mathematics. Similarly, the drawing of the school is the drawing of the shop. The problems which the boy finds in the shop today are dwelt upon at length in the school tomorrow.

I mention this German system because it is an example of the most intense endeavor to adjust men and women to their environments. For more than a generation past, Germany has realized its responsibility in this direction and it has endeavored to solve its problem in a most thorough method. The effect of the extraordinary system of technical and industrial education which it is following has made its presence felt on the progress of German industry and commerce. Before the Franco-Prussian war Germany was, industrially and commercially, a rather unimportant nation. After German unity had been accomplished, the nation devoted itself to the development of its educational system and to the elevation of its industry and commerce. As a result, the nation has become one of the most important manufacturing and commercial countries of the world, a tremendous rival in that respect of other progressive nations. While Germany's educational system is not the sole cause of its prosperity, it is, nevertheless, one of the most important causes and, by the Germans themselves, it is regarded as the leading cause. And what is true of Germany is also true to a great extent of several other European countries.

Manual Training in the United States.

Manual training, as pursued in the United States, is but an elementary conception of the German idea, a system more desirably adopted to a democracy. Nevertheless, the underlying motive is much the same with us as in European countries. After all, we are endeavoring, just as they are doing, to provide educational opportunities that will enable a man to make the most of his natural capacities, his industry, and his character, whatever his origin in life may have been.

In Pittsburg, as perhaps in some other large cities, experiments have been made in four forms of industrial education. The old-fashioned apprenticeship system, which has for its object the output, with an incidental emphasis on varied skill, has been modified to meet new industrial conditions. A second type of industrial education has been patterned after the continuation schools of Europe, with evening instruction to supplement the practical shop work. However, this system makes its appeal to but a small percentage of the whole apprenticeship group, as it involves additional effort on the part of each apprentice and an added labor which is often difficult to exact from these young men.

Trade School.

The third type of industrial education which has received considerable attention is the short time or intensive trade school. This method of teaching emphasizes skill and practice and is measured largely by the quality of the skill and the speed of performance. This system has become a very popular one and is receiving the support of many persons. It comes as a natural step in the progress of industrial education, which is begun by the manual training idea, and is another link in the chain of communal adjustment.

A new and fourth type of industrial education is now being formulated in the day industrial course of the School of Applied Industries of the Carnegie Technical Schools, which, departing from the usual custom of emphasizing skill alone, is outlined to include a broad general foundation for habits of observation, initiative and thoroughness. It endeavors to train the mind and give a knowledge of processes, leaving the acquirement of exceptional skill to the student's after career in gainful occupations. Special emphasis in these courses is placed on the necessity of the graduate becoming a good citizen, having those principles of right living, personal hygiene and a knowledge of the general industrial

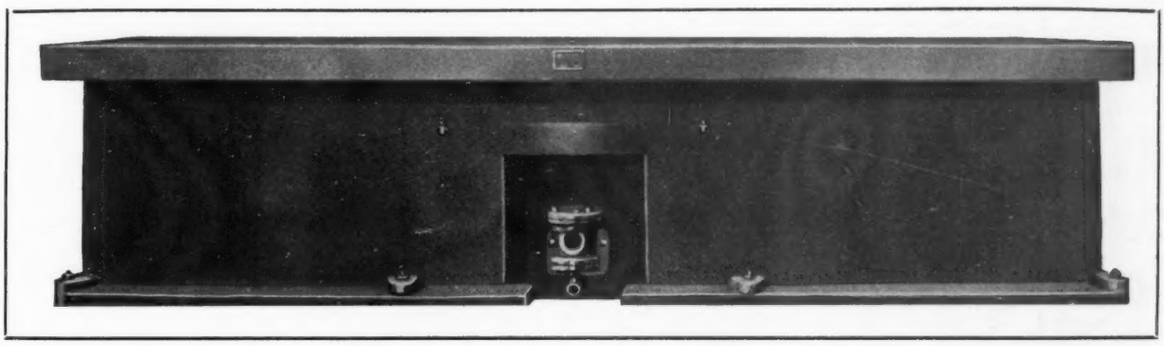
[1]From an address by Clifford B. Connelly, dean of the School of Applied Industries, Carnegie Technical Schools, Pittsburg, delivered before the National Educational Association at the annual convention in San Francisco.

conditions of the country at his command to enable him to become resourceful in the event of necessity. The plan of instruction contemplates courses which comprise a group of correlated trades and industries so that the graduate may have a wide range of opportunity when seeking employment. We are supplying our community with hundreds of competent young workmen, all able to take their places in the proper development of the city's resources. But whatever be the form of school or the system of education which is applied in any locality, this much remains—manual training is one of the most helpful adjuncts known today in the adjustment process.

Large Jar-Ramming Machine

The jar-ramming molding machine, shown in the accompanying illustration, built by the Herman Pneumatic Machine Co., Zelienople, Pa., is equipped with a table, 4 x 12 feet, and has a capacity for lifting 25,000 pounds at an air pressure of 80 pounds. The machine consists essentially of a cast steel table plate, plunger, cast iron base and an automatic control valve. To prevent the table plate from tilting as a result of unbalanced loads and also to relieve the stress that would otherwise be thrown upon the plunger, eight wearing plates of ample length and width are employed. The plates serve as guides and are lubricated by reservoirs containing packing waste and oil, located in the table plate. Oil for the cylinder is delivered by a pipe to a groove which extends around the cylinder interior. This method of oiling is practically dustproof. The table plate is provided with an apron which partly envelops the base, thereby protecting the interior of the machine from the sand.

The machine is controlled by an automatic differential valve which is operated by air that would be otherwise wasted. The port from the valve to the cylinder is short and being straight, there is no loss of efficiency by short turns or choked passages. The movable part of the valve has a travel of 3-16 inch and as it is automatic, the air consumption is limited to the amount required to lift the load a certain number of blows a minute. The automatic and positive action of this valve prevents injury to the machine as a result of careless operation. The valve consists of a top and bottom head, double check valve stem, differential piston and the body. All operating parts are inside of the body, and the only openings consist of the inlet, the port to the cylinder and the exhaust to the atmosphere. The seats of the valve are so arranged that the valve may be reground a number of times. This machine has been especially designed for long flasks and by the use of I-beams clamped on the table plate, flasks having a length of 25 feet can be satisfactorily rammed. Two machines of this size are now in operation in foundries in the Pittsburgh district.



HERMAN JAR-RAMMING MOLDING MACHINE

Accident Prevention

At the annual meeting of the National Metal Trades Association, a resolution was adopted which provided for the appointment of an inspector, whose duty it will be to visit the shops of the members of this organization and to recommend safeguards for equipment to minimize accidents. An inspector has already been appointed and thus far his operations have been very successful. Robert Wuest, commissioner of the association, New England building, Cleveland, has in preparation a catalog containing the names and addresses of manufacturers of safety devices for the use of the members of this organization.

A New Crucible Steel Plant

The DeBats Crucible Steel Co., Pittsburgh, incorporated recently with a capital stock of $125,000, announces that a site has been secured near Washington, Pa., on which a new plant will be built. Two buildings will be erected. The larger structure, 60 x 100 feet, will be used as a foundry, while the smaller building, 40 x 60 feet, will contain a converter and a cupola. The company will manufacture high grade steels. Lewis DeBats, inventor of the new process, is president, and Charles Snyder, of Pittsburgh, is vice president and secretary of the company. The construction of the plant will be under the direction of N. A. Vandervort, Pittsburgh. It is expected that the new plant will be ready for operation late in February.

The Commonwealth Power Co. has been authorized by the Michigan railroad commission, to issue bonds aggregating $1,860,000, proceeds of which will be used largely in extending and enlarging various power plants owned by this concern in the state. Among these are the following: Saginaw Power Co., $90,000; Bay City Power Co., $17,000; Pontiac Power Co., $36,000; Flint Power Co., $54,000; Commonwealth Power Co. of Jackson, $72,000, and Consumers' Power Co., Owosso, $36,000.

The Curtis Jack & Truck Co., St. Louis, the incorporation of which was recently noted, advises that it will manufacture a combination jack and truck for automobiles that can be used for four purposes, namely, jack, truck, turntable and tire rest. The main office of the company will be in the Bank of Commerce building, St. Louis, and A. W. Smith is the secretary and treasurer. The company has also rented a shop with full equipment and will not build or purchase machinery at present.

RAIL FAILURE

Report by Coroner on Lehigh Valley Wreck at Manchester, N. Y.

An exhaustive report, covering the different aspects of the disastrous wreck to a Lehigh Valley railroad train which occurred at Manchester, N. Y., Aug. 25, 1911, causing the death of 30 persons, has been filed by Coroner Daniel A. Eiseline, of Shortsville, N. Y., who conducted the inquiry. Coroner Eiseline finds that the wreck was due to a "pipe" in the web of the rail and that the Lehigh Valley road was negligent in permitting the defective rail to remain, in shortened form, in the track.

The report is, in part, as follows:

The breaking of the rail was beyond doubt the cause of the derailment and the consequent wrecking of the cars. This rail was 24 feet long. It was rolled at the mills of the Bethlehem Steel Co., Dec. 24, 1909, and was 90 pounds to the linear yard, basic open-hearth steel, "A" rail, 30 feet long, from heat No. 14,208. On Oct. 21, 1910, this rail was laid in the tracks. In April, 1911, a new frog was put in the track, replacing the old one, and at this time the rail was shortened by cutting off 6 feet from one end. Three bolt holes were drilled in the web of the cut and for the splice plate. At the time of the derailment this rail was broken into numerous pieces, 17 of which were found. These, when assembled, represented 18 2-3 feet of the rail.

The broken rail shows serious defects. What is known as a "pipe," or split, extended longitudinally in the web throughout the length of the rail. This was not visible at the hot-sawed end but was plainly visible at the cut end. This "pipe" was not a result of the accident, but must have been present when the rail came from the mill.

The analysis of the metal in this rail by Eurique Touceda, professor of metallurgy at the Renssalaer Polytechnic Institute, and James E. Howard, engineer-physicist, bureau of standards, Washington, D. C., shows that, with the single exception of manganese content, which was found to be about 1.20 per cent, it was well within the specifications of the railroad company. The sulphur content was about 0.033 per cent. From the evidence of Robert Job, analytical chemist for the Lehigh Valley Railroad Co., and the report of Prof. Touceda and Mr. Howard, it appears that the "pipe" was not the primary cause of the failure of the rail. Small transverse and longitudinal fissures were found in the gage side of the head of the rail and constituted the most serious defect. The seriousness of these fissures becomes apparent from the fact that they are not visible on the surface of the rail.

Mr. Job, giving his testimony on the witness stand, without having had an opportunity of making an analysis of the rail and its defects, stated that, in his opinion, these defects were due to faulty mill practice, though he did not know the precise cause.

Prof. Touceda, in his report, finds that the fissures occur only on the gage side of the head of the rail, and attributes them to the high manganese content, his analysis showing 1.21 per cent. At this percentage he is convinced that steel is "cord short" under shock, and that the high manganese content facilitates the formation of checks when sudden blows are imparted to the steel or the gage is used to straighten it. He thinks that these checks in this case "progressed" under the influence of vertical stresses on the rail, due to the weight of trains passing over it.

In his report, Mr. Howard says: "The cold rolling of the running surface of the head of the rail by heavy wheel pressures has introduced internal strain in the steel at and for a short distance below the running surface. Those internal strains are of compression and they reach their greatest intensity on the gage side of the head, where flow of steel takes place in a lateral direction. No foreign substance in the steel is needed to account for the inception of those fissures."

The introduction of internal strains in a hard, and less ductile steel than heretofore used for rails, under excessive wheel pressure seems adequate to explain the occurrence and frequency of these internal fissures. The fissures, if this explanation of their origin is true, should not be found in new rails, unused, and it is understood that the steel company that rolled this particular rail has been unsuccessful in finding any such fissures in new rails, notwithstanding a very energetic effort has been made to discover them. This development of internal fissures and seams, transverse and longitudinal, suggests that the limit of wheel pressures in conjunction with the bending and shearing stresses, which occur simultaneously therewith, has been reached and surpassed on rails of usual shape and width of head. It can hardly be a coincidence that all of the rails which are displaying those interior fissures have hidden structural defects on one side of the head and none on the other, and chance to be laid with the defective side on the gage side, where it is found. Evidence points to track conditions as accountable for the development of these fissures. Some parts of the track are subjected to more severe conditions than other parts. Places where the stresses on the head from wheel pressures are reversed in their direction would afford examples of maximum severity. Such places are found where trains stop and start, as, for example, the station and cross-over in question at Manchester.

The evidence shows conclusively that the fissures in the rail were the primary cause of its failure in the track. That the "pipe" in the web is a defect is also shown. The evidence shows that, after the breaking of the rail, although the split or pipe was not visible in the hot-sawed end, it was plainly so at the cut end and extended in the web, throughout the length of the rail. There is no doubt that the pipe was in the rail at the time it was shortened and relaid in April, 1911. An adequate inspection at that time would have demonstrated the presence of the split, or pipe, at the cut end.

Completes Trial Order of Titanium Rails

Steelton, Pa., Dec. 16.—With the completion of a trial order of 2,000 tons of rails for the Lehigh Valley railroad by the rail mill department of the Pennsylvania Steel Co. here, it is expected that a large order will result, as the Lehigh Valley contemplates purchasing rails for a considerable stretch of its road.

The trial rails were made of titanium steel. The rails will be used by the purchaser at places that are especially dangerous along the line in order to obviate any possibility of a repetition of the disastrous wreck last summer on that road when a number of G. A. R. veterans were killed by the breaking of a rail.

It is customary for railroads to place two inspectors at each steel plant where rails are being rolled for any of the roads, but the Lehigh Valley has had ten inspectors at the plant here, six on duty in the day time and four at night, and each rail was rigidly inspected before being accepted. If the test order just completed is satisfactory, it is expected that a large order will result.

The past week has been one of more activity around the works of the Pennsylvania Steel Co. than for some time. The departments were all in operation and the output heavy. The open-hearth was busy, five furnaces being on at the new plant and five at the old. It is expected that more furnaces will be put to work.

Car Awards Will Go to Courts

San Francisco, Dec. 13.—By a vote of two to one, the board of public works, of San Francisco, awarded the contract for 43 pay-as-you-enter type cars from the Holman Car Co. of this city, for $337,231. Michael Casey, president of the board, refused to sanction the deal, declaring that the law specifically stipulates that the lowest bidder shall receive the award on all public contracts. By his action the company will have to institute mandamus proceedings before it can manufacture the cars, if it can do so at all. The Jewett Car Co., Newark, O., was the lowest bidder, offering to do the work for $287,231.

IRON AND STEEL SECURITIES

Trading on the New York stock exchange last week was featured by irregular price movements, with occasional sharp advances. Most activity was manifested in Steel Corporation securities.

Monday, stocks were irregular, but finally turned very strong, closing from 1 to 3 per cent higher in the active issues; the cotton market declined to a new low price for the year. Tuesday, the market was dull but maintained its firm undertone; cotton went to a new low price but recovered slightly; foreign markets were firmer. Wednesday, marked strength developed in the stock market towards the close and prices advanced 1 to 2½ per cent; Steel common went to the highest price level since the institution of the government's suit. Thursday, Steel common made a further advance; copper stocks advanced as the result of higher quotations on the metal; cotton rallied, while grain reacted. Friday, stocks were irregular but finally closed firm with small net change. Saturday, the market was active, strong and higher, prices reaching the highest levels of the week under the leadership of Steel common and Lehigh Valley.

Money on call receded from the exceptionally high rates of the week previous and ranged between 4¾ and 2½ per cent. Time money rates were somewhat stiffer at the close of the week, due to insufficient offerings. The actual condition of clearing house institutions showed loans increased $12,916,000; net deposits increased $17,395,000; total reserve, $399,023,000; and the excess of reserve $15,627,400, an increase of $3,931,150. Non-member banks and trust companies showed loans decreased $1,986,300; net deposits decreased $3,378,900; reserve on deposits increased $621,200, and the percentage of reserve, 18.9, against 18.8 the previous week. Fortnightly railroad statistics showed an increase of 13,033 in the idle car surplus. Bank clearings showed a decline of less than 1 per cent from the preceding week and an increase of 5.2 per cent above last year. Commercial failures numbered 345, compared with 310 the previous week and 283 the corresponding week last year. Shares were sold to the number of 3,235,600, compared with 1,924,350 the week previous, and 1,763,600 the corresponding week last year. Bonds, exclusive of government bonds, were sold to the amount of $22,017,000, compared with $24,341,000 the week previous and $12,829,000 the corresponding week last year.

	Clos'g Quo. Dec. 16	Changes in week.	Annual Meeting date 1911		Stock Outstanding	Basis.	Dividend Last Dividend	Date Last Div. Pay
Allis-Chalmers	1⅜	— ¾			$19,820,000		.....	
Allis-Chalmers, pr	7⅝	—1¼	Nov.	2	16,150,000	7 cum.	1¾ Q.	Feb., 1904
American Can	11	+ ¼	Feb.	1	41,233,300		1¾ Q.	
American Can, pr	90⅛	— ⅜			41,233,300	7 cum.	1¼ Q.	Jan., 1912
Am. Car & Fdy	54½	+1½	June	29	30,000,000		½ Q.	Jan., 1912
Am. Car & Fdy., pr	117	.....			30,000,000	n. c	1¾ Q.	Jan., 1912
American Loc	37	+2½	Oct.	17	25,000,000	5	1¼ Q.	Aug. 1908
American Loc., pr	104	+1⅜			25,000,000	7 cum.	1¾ Q.	Jan., 1912
American Ship	49½	+ ½	Oct.	11	7,600,000	4	2 Q.**	June, 1911
American Ship, pr	105	.....			7,900,000	7 cum.	1¾ Q.	Oct., 1911
Am. Steel Foundries	33	— ⅞	Dec.	7	17,184,000		1 Q.	May, 1911
Barney & Smith	15	.....	June	6	2,000,000	4	1 Q.	Dec., 1907
Barney & Smith, pr	70	.....			2,500,000	8 cum.	2 Q.	Dec., 1911
Bethlehem Steel	29¾	+ ¾	April	4	14,862,000		.....	
Bethlehem Steel, pr	58¾	.....			14,908,000	7 n. c.	¾ Q.	Feb., 1907
Cambria Steel	44¾	+1¼	Mar.	21	45,000,000*	5	1¼ Q.	Nov., 1911
Cambria Iron	44⅜	+ ⅜			8,468,000*	4	2 S. A.	Oct., 1911
Chicago Pneumatic Tool	46½	+ ½	Feb.	20	6,485,800	4	1 Q.	Oct., 1911
Colorado Fuel	28¾	+2¾	Oct.	16	34,235,500		1¾ Q.	April, 1902
Crucible Steel	11½	— ⅛	Oct.	18	24,578,400		3½ Q.	
Crucible Steel, pr	81⅞	+ ⅛			24,463,500	7 cum.	1¾ Q.	Dec., 1911
Empire Steel	6	.....	Feb.	22	1,254,770		.....	
Empire Steel, pr	40	.....			2,500,000	6 cum.	1 S. A.	July, 1911
Fay & Egan	70	.....	Feb.	21	1,000,000	6 cum.	3 S. A.	Feb., 1911
Fay & Egan, pr	110	.....			1,000,000	7 cum.	1¾ Q.	Nov., 1911
General Electric	155½	+4	May	9	65,179,600	8	2 Q.	Jan., 1912
Harbison-Walker	40	.....	Jan.	16	18,000,000		½ Q.	Dec., 1911
Harbison-Walker, pr	99	.....			9,600,000	6 cum.	1½ Q.	Oct., 1911
International Pump	33¼	+ ¼	Dec.	12	17,762,500		1 Q.	Nov., 1910
International Pump, pr	83½	+ ½			11,350,000	6 cum.	1½ Q.	Nov., 1911
Lackawanna Steel	30	.....	Mar.	4	34,978,000		.....	
Lake Sup. Corp	27¾	+1½	Oct.	4	40,000,000		.....	
New York Air Brake	56	+1	Mar.	8	10,000,000	6	1½ Q.	July, 1911
Niles-Bement-Pond	94	.....	Feb.	8	8,500,000	6	1½ Q.	Dec., 1911
Niles-Bement-Pond, pr	104	.....			2,000,000	6 cum.	1½ Q.	Nov., 1911
Otis Elevator Co	70	+2	Mar.	20	6,375,000	1	1 Q.	Jan., 1912
Otis Elevator Co., pr	96	.....			6,310,000	6 n. c.	1½ Q.	Jan., 1912
Pa. Steel	60	.....	May	8	10,750,000		.....	
Pa. Steel, pr	102½	.....			16,500,000	7 n. c.	3½ S. A.	Nov., 1911
Pittsburgh Coal	18¼	+1¼	Feb.	10	28,104,600		.....	
Pittsburgh Coal, pr	82⅞	— ⅛			27,071,800	7 cum.	1¾ Q.	Oct., 1911
Pittsburgh Steel Co., pr	102½	+1½	Oct.	31	7,000,000	7 cum.	1¾ Q.	Sept., 1911
Pressed Steel Car	33¼	+1¼	Feb.	15	12,500,000		1 Q.	Aug., 1904
Pressed Steel Car, pr	100	.....			12,500,000	7 n. c.	1¾ Q.	Nov., 1911
Pullman	157½	— ½	Nov.	8	120,000,000	8	2 Q.	Nov., 1911
Railway Stl. Spring	31⅞	+ ⅞	Mar.	2	13,500,000	2	1 S. A.	Oct., 1908
Railway Stl. Spring, pr	98½	.....			13,500,000	7 cum.	1¾ Q.	Dec., 1911
Rep. Iron & Steel	25⅜	+2⅜	Oct.	18	27,191,000		.....	
Rep. Iron & Steel, pr	84	+2			25,000,000	7 cum.	1¾ Q.	Jan., 1912
Sloss-Sheffield	42½	+3½	Mar.	15	10,000,000	5	1¼ Q.	Sept., 1910
Sloss-Sheffield, pr	112	.....			6,700,000	7 n. c.	1¾ Q.	Jan., 1912
U. S. Pipe & Fdy. Co	16	+1	June	28	12,106,300		1 Q.	Dec., 1910
U. S. Pipe & Fdy. Co., pr	50	+1¼			12,106,300	2	1¼ Q.	June, 1911
U. S. Steel	68⅝	+6⅝	April	17	508,302,500	5	1¼ Q.	Dec., 1911
U. S. Steel, pr	111¼	+2½			360,281,100	7 cum.	1¾ Q.	Nov., 1911
U. S. Steel 5s	101¾	— ⅛			463,798,000	5	.....	
Va. Iron, Coal & Coke	71¼	+1¼	Sept.	19	9,073,680		5. †	Oct., 1907
Westinghouse Electric	68¾	+4¾	July	26	3,998,700*		1¾ Q.	Oct., 1911
Westinghouse Air Brake	154	+ ¼	Oct.	3	13,750,000*		5 Q.‡	Oct., 1911

Par value of shares, $100, except those starred (*), $50.
**Includes last 1 per cent payment of 4 per cent extra.
†Stock.
‡Includes 2½ regular, 1½ extra and 1 special.

Copper Stocks.

New York.—Amalgamated Copper closed 66⅜, a net gain of 4¾.

Boston.—Butte Coalition closed 19¾, a net gain of 3; Calumet & Arizona closed 59¾, a net gain of 3⅞; Calumet & Hecla closed 422, a net gain of 32; North Butte Mining closed 26⅛, a net gain of 1¾; Quincy Mining closed 70, a net gain of 6½.

Financial Notes.

The Canadian Westinghouse Co., Ltd., has declared the regular quarterly dividend of 1½ per cent, and an extra dividend of 1 per cent on its stock, payable Jan. 10.

The American Brake Shoe & Foundry Co. has declared the regular quarterly dividends of 1¾ per cent each on its common and preferred stocks, payable Dec. 30.

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THE AVERAGE PAID CIRCULATION OF THE IRON TRADE REVIEW FOR THE ISSUES OF THE FOLLOWING MONTHS WAS:

January, 1911	6,058
February	6,072
March	6,091
April	6,108
May	6,112
June	6,124
July	6,138
August	6,152
September	6,161
October	6,172
November	6,186

December 21, 1911

Three Causes of Railroad Buying

The inauguration of a new period of railroad buying of iron and steel and their products prompts the reflection that there are three, rather than the commonly accepted two causes for railroad buying. One cause, of course, is the ordinary wearing out of material, while another is the making of extensions or other additions by which capacity is increased.

A third cause of railroad buying is the necessity of replacement, not because the material is worn out, but because on account of progress in methods or appliances it is no longer fitted for the service for which it was installed. A striking exemplification of this third cause for buying was furnished in the burst of railroad buying a few years ago, and which occurred largely in 1905 and 1906. In that period, a large tonnage of rails was replaced, not because they had been worn out in ordinary service, but because they were too light for the heavier loads and greater speeds which had come into vogue. If the conditions of traffic had not changed from those which existed when the rails were laid, they would have performed their function well for many years more. As it was, the heavy engines and cars mashed them down at a great rate, and a very large mileage had to be relaid, not with rails of the same section, but with rails of a much heavier section. At about the same time, the discovery was made that a large number of railroad bridges, large and small, were not strong enough for the heavier duty, the introduction of heavy locomotives and cars greatly increasing the burden per lineal foot upon the bridges. Improvements had to be made wholesale by way of strengthening or replacing bridges. Only a few years ago, it was regarded as rather an interesting discovery in railroad circles that many old wooden cars, amply durable if used simply as they had been built to be used, with similar cars, could not be put in trains with the new steel cars, as quick stops were likely to collapse them, while a relatively mild collision would be likely to destroy all that chanced to be in the train. It became necessary for railroads having many of the new cars not only to discard the frailest of their old cars, even though in a good state of preservation, judged by the former standard, but also to make rules as to the character of cars they would accept from other lines to make part of their trains.

Thus we have three classes of railroad buying, for replacement of that which has worn out in ordinary service, for extensions, whether of track, of rolling stock or of other facilities, and replacement of that which, while good of its kind, can no longer be used because certain improvements have been made.

For a long time the standard in steel car construction was the car weighing about 40,000 pounds and having a carrying capacity of 100,000 pounds. In the early years, the weight of these cars increased, but not their carrying capacity. When the steel car was first introduced, the builders expected to have difficulty in convincing all railroad men of their merit, because full credit for the increased carrying capacity might not be regarded as sufficient offset against the increased weight, as compared with the old wooden cars, though weight for weight the steel car was really much more efficient. Chiefly by reason of this fear, the early 100,000-pound cars were made light, 36,000 to 38,000 pounds in weight, but as experience grew and railroad men generally realized the advantage of the great carrying capacity, the weight was increased, by from 10 to 15 per cent. On one or two private roads cars of much heavier capacity have been used for some time, but for general service the car upon which the Pennsylvania railroad is now asking prices will represent the first substantial jump from the original type of steel car. The new Pennsylvania car will have a rated capacity of 140,000 pounds at least, and will weigh correspondingly more than the old car. Even very lately heavier locomotives have been brought into service, and these changes, of heavier cars and heavier locomotives, bid fair to inaugurate another period of laying heavier rails and strengthening bridges, comparable to that which occurred some half dozen years ago. At that time, much of the rail replacement was of 50 to 65-pound rails with 75 and 85-pound sections, the 100-pound rail not being used very extensively in the west. The new period, however, is likely to carry the section beyond 100 pounds, and already there has been talk of a 125-pound rail. If the railroads of the country had ample funds, we should likely see quite a wholesale adoption of heavier cars, heavier locomotives, heavier bridges and heavier rails. Almost unlimited funds could thus be spent, promising a fair return in the long run through reduced operating

cost and reduced expense of replacement. In the circumstances, however, such improvements must come gradually, but a point to be considered is that the general operation is not simply that of replacing worn out material, or of increasing carrying capacity, it is also the correlation of the different factors to bring them all up to the standard set by a given improvement.

The question of the steel tie, so actively discussed a half dozen or more years ago, but lately a dormant issue, is likely to be brought up afresh in the period of heavier cars and rail sections which is about to be entered. There have been many opinions about the steel tie, and it is not altogether a settled question whether it is for light loads or heavy loads, high speeds or low speeds, that the steel tie is best adapted. Experienced men have spoken on both sides of these questions. As the steel tie has been little discussed in very recent years, the new conditions arising may cause the whole subject to be taken up afresh.

A Tremendous Task

The report of the railway securities commission, headed by President Arthur T. Hadley, of Yale, has just been submitted to President Taft and illustrates in a very striking manner the importance of moving slowly in attempts to regulate industrial affairs. The commission was appointed in 1910, when the senate refused to accept the house amendment to the pending railroad bill providing that all further issues of railroad securities be placed under the control of the interstate commerce commission. The commission's report is decidedly opposed to the proposed method of regulating securities. President Taft, in transmitting the report to congress, declared that he heartily concurred in the recommendations. The commission's principal conclusions are:

That any attempt by congress to adopt the policy of federal regulation to the exclusion of state regulation would be premature.

That for the present, state authorities should make a concerted effort to harmonize existing requirements.

That congress should prepare for the future by giving consideration to a federal incorporation act which would permit interstate railroads to exchange their state charters for national ones.

The commission holds that constitutional questions involving the extent of federal authority are still unsettled, and that while such condition exists, an attempt to add federal regulation to state regulation would lead to serious conflicts which would make conditions worse rather than better. Fortunate indeed is it that congress did not rush into an attempt at regulation which would have made the national government appear ridiculous. The commission declares that actual knowledge of the facts surrounding the issue of the securities and the expenditure of the proceeds is the matter of most importance and such knowledge congress did not have, nor is it possessed by anyone today. "It is," says the commission, "the only thing upon which the federal government can effectively insist today." The Hadley commission believes that if publicity is enforced, there will be no necessity for a law to require approval in advance for the issue of such securities. There is, indeed, positive ground for objection to advance authorization, which would be construed by many investors as a guaranty or official recommendation of securities.

We believe that very much the same condition prevails in regard to other industries as has been found to exist concerning the railroads. All incorporations are regulated to some extent by the states and pay taxes to the states. If the affairs of all corporations doing any interstate business are to be supervised by the federal government, it will be necessary to readjust the relations of those corporations to the states. This would be a tremendous task and would have to be carried out with the greatest discretion in order to avoid conflicting with the rights of the states. It is a task which would demand the time, thought and energy of the ablest men in the country, and even such men could not accomplish it for years.

Change of Subscription Price

The subscription price of The Iron Trade Review *will be $4 a year beginning Jan. 1, 1912. The great growth of the publication in the last few years, the high standard of service maintained and the consequent increased cost of production have made the present low price of the publication entirely disproportionate to the time, expense and labor attending its manufacture.*

The unit cost for paper, printing and mailing one copy of the paper for one year to one subscriber is a fraction over $6.88. This amount does not include the salaries, office expenses and similar items of the forty-seven members of the staff, correspondents and others engaged in producing the publication and located in every important industrial center, domestic and foreign.

The new price is, therefore, simply the result of the ordinary good business policy of making the selling price of an article bear some relation to the cost of manufacture.

Will Go to Riter-Conley Mfg. Co.

E. L. Messler, who for the past 12 years has been general superintendent of the Jones & Laughlin Steel Co.'s Pittsburgh coke ovens and blast furnaces, has tendered his resignation to become assistant to the president of the Riter-Conley Mfg. Co., of Pittsburgh, on Jan. 1.

While Mr. Messler was with the Jones & Laughlin Steel Co. a record on furnace dismantling and rebuilding was made—No. 3 furnace of the Eliza group being torn down, a 400-ton salamander taken out, foundations put in and a new 22-foot x 96-foot furnace erected with 1-inch triple riveted, double butt, strapped shell with tight top, top rigging and lining, downcomer, dust catcher and foundation, gas mains and cast house, in 73 days. A year previous No. 1 furnace of the same group was rebuilt, which involved the same work, in 95 days.

Prior to his connection with the Jones & Laughlin Steel Co., Mr. Messler was assistant superintendent of the Duquesne blast furnaces of the Carnegie Steel Co. and was one of the heads of the construction force in the building of these furnaces, the first of the modern, large blast furnaces in the country.

Ore On Docks Most With One Exception

Yet Difference is Not so Marked When Figures Are Analyzed—Smaller Shipments to Furnaces

Figures compiled by *The Marine Review* from the returns sent in by the various dock companies show that iron ore receipts at the Lake Erie ports during the season of 1911, were 25,531,550 tons, out of a total movement of ore by lake of 32,130,411 tons. Lake Erie docks on Dec. 1 held a balance of 9,131,664 tons, which is the largest store on hand in the history of the traffic with the exception of last year when the docks on Dec. 1, held a balance of 9,426,881 tons.

During 1910 the total shipment by lake was 42,620,201 tons, of which Lake Erie docks received 34,042,897 tons and held a balance on Dec. 1, of 9,426,881 tons. During 1909 the total shipment by lake was 41,683,873 tons, of which Lake Erie docks received 33,672,825 tons and held a balance on Dec. 1, 1909, of 8,965,789 tons. During 1908 the total shipment by lake was 25,427,094 tons, of which Lake Erie docks received 20,414,491 tons, and held a balance on Dec. 1, 1908, of 8,441,533 tons. During 1907 the total shipment by lake was 41,288,755 tons, of which Lake Erie docks received 35,195,758 tons and held a balance on Dec. 1, 1907, of 7,385,728 tons. The reserve of 9,131,664 tons is more than will be needed for winter consumption. Never in the history of the trade have 5,000,000 tons gone forward from dock to furnace during the winter season.

Shipments to furnaces between May 1 and Dec. 1, 1911, aggregate 23,178,370 tons, compared with 30,050,096 tons in 1910, 30,077,304 tons in 1909, 17,453,258 tons in 1908, 29,787,018 tons in 1907, 27,615,392 tons in 1906, 24,311,720 tons in 1905, 16,658,806 tons in 1904, 16,903,013 tons in 1903, 18,423,364 tons in 1902 and with 14,204,596 tons in 1901.

The shipments to furnaces during the season of navigation, as referred to, are determined in this way: First, we have the amount of ore on Lake Erie docks as of May 1 last, 6,778,494 tons; add to this the receipts of the season just closed, 25,531,550 tons, and the total is 32,310,044 tons; deduct the amount on dock Dec. 1, 9,131,664 tons, and we have 23,178,380 tons as the amount that was forwarded either direct or from dock to furnace yards. The ore on dock as of May 1, as compiled from figures received from the dock companies amounted to 6,850,285 tons. This total, however, included April receipts amounting to 71,791, which must of course be deducted before adding receipts for the season, which also include the April receipts.

It is of course understood that the difference between the total output of 32,130,411 tons which was shipped from the Lake Superior mines during 1911, and the receipts of 25,531,550 tons at Lake Erie ports, is ore that went to places other than Lake Erie ports, such as the furnaces at Lake Michigan ports. The accompanying table shows receipts at Lake Erie ports and amounts on dock during six months past

IRON ORE RECEIPTS AT LAKE ERIE PORTS, GROSS TONS.

	1911.	1910.	1909.	1908.	1907.	1906.
Toledo	493,345	1,225,202	1,374,224	680,553	1,314,140	1,423,741
Sandusky	.....	.....	11,088	.....	83,043	35,847
Huron	223,947	197,951	243,082	213,377	971,430	778,453
Lorain	2,937,605	2,884,738	2,796,856	2,286,388	2,621,025	2,191,965
Cleveland	4,584,211	6,344,943	6,051,342	4,240,815	6,495,998	6,604,661
Fairport	666,365	1,516,434	1,734,277	1,518,961	2,437,649	1,861,498
Ashtabula	6,359,131	9,620,638	8,056,941	3,012,064	7,521,859	6,833,352
Conneaut	6,931,278	6,309,548	7,007,834	4,798,631	5,875,937	5,432,370
Erie	289,400	942,592	1,235,057	828,602	2,294,239	1,986,539
Buffalo	2,802,976	4,704,439	5,002,235	2,835,099	5,580,438	4,928,331
Detroit	243,292	296,412	159,889	.....	.....	.....
Total	25,531,550	34,042,897	33,672,825	20,414,491	35,195,758	32,076,757

IRON ORE ON LAKE ERIE DOCKS, DEC. 1, GROSS TONS.

	1911.	1910.	1909.	1908.	1907.	1906.
Toledo	661,382	433,215	332,456	590,925	518,645	281,000
Sandusky	2,471	17,728	39,557	36,079	44,546	17,467
Huron	344,371	375,118	477,333	458,158	415,730	245,499
Lorain	314,321	259,448	407,129	426,274	366,271	336,321
Cleveland	1,589,491	1,638,795	1,547,142	1,458,392	1,281,335	1,224,606
Fairport	636,566	839,970	867,640	835,821	523,981	590,783
Ashtabula	3,295,862	3,287,816	2,594,359	2,293,531	2,056,820	1,631,312
Conneaut	1,237,573	1,329,997	1,411,002	1,296,675	1,000,774	1,057,424
Erie	636,274	792,011	788,046	730,530	652,219	552,631
Buffalo	413,353	452,783	501,125	315,148	435,407	315,412
Total	9,131,664	9,426,881	8,965,789	8,441,533	7,385,728	6,252,455

Acquires Tool Plants

The Easton Tool & Machine Co., Easton, Pa., recently incorporated, has, through purchase and consolidation, become the sole owner of the Jackson Vise & Tool Co., of Vineland, N. J., and the R. J. Lippey Pattern Works, of Easton, Pa. C. J. Jackson has been retained as engineer and general manager and the new company is making preparations to increase the lines of Jackson's patented machinists' bench vises, the sectional jaw pipe vises and other specialties formerly manufactured by the Jackson Vise & Tool Co., which include the utility drill press vise and the "turn-easy" blow-off cock. The company has increased its equipment and has secured an option on additional buildings adjoining its plant, which it is about to occupy. Accordingly, no new construction is contemplated at present. The Easton Tool & Machine Co. is capitalized at $25,000 and the officers are C. L. Sonen, president; A. E. Diefenderfer, vice president; R. J. Lippey, treasurer; C. J. Jackson, secretary and general manager.

Frick Optimistic.—Henry C. Frick is reported on New York advices to be optimistic on the trade situation in the iron and steel industry. He is understood, according to the New York papers, to have told some of his friends that in his opinion the steel business will keep on improving until the past high records of production and consumption will be eclipsed. The feeling is also very apparently increasing among leading steel men in New York that a significant change has come upon the industry which is likely to be maintained until former active conditions are re-established.

The Canadian Sirocco Co., Ltd., with $100,000 capital, has been incorporated by James Inglis, Chas. H. Gifford, F. R. Still and R. T. Coe, of Detroit, and Wm. C. Redford, of New York, all affiliated with the American Blower Co. A plant will probably be built at Windsor, Ont.

OLIVER COMPLAINS

Of Discrimination Against Pittsburgh —His Estimate of Carnegie.

United States Senator George T. Oliver, of Pittsburgh, appeared, Dec. 15, before the house committee investigating the United States Steel Corporation. The senator expressed his faith in the continued importance of Pittsburgh as a manufacturing center, but he said he had made investigations and had come to the conclusion that the city's principal drawback lies in the cost of transporting ore from the lower lake ports to the Pittsburgh furnaces. He submitted a table of ore rates, in part as follows:

Ashtabula to Pittsburgh, 128 miles, 26 cents per gross ton, or $.0075 per ton per mile railroad gross earning.

Cleveland to Wheeling, 160 miles, 60 cents per gross ton, or $.0037 per ton per mile railroad gross earning.

Cleveland to Roanoke, Va., via Columbus, O., 618 miles, $1.70 per gross ton, or $.0027 per ton per mile gross earning.

Buffalo to Josephine, Pa., 228 miles, 85 cents per gross ton, or $.0037 per ton per mile railroad gross earning.

Baraboo, Wis., to Chicago district furnaces, 190 miles, 70 cents per ton, or $.0036 per ton per mile railroad gross earning.

Toledo, O., to Ironton, O., 250 miles, 90 cents per gross ton, or $.0036 per ton per mile railroad gross earning.

Buffalo to South Bethlehem, Pa., short line mileage 353 miles, $1.45 per gross ton, or $.0041 per ton per mile railroad gross earning.

Buffalo to South Bethlehem, Pa., long haul mileage 416 miles, $1.45 per gross ton, or $.0034 per ton per mile railroad gross earning.

The senator said that the operating cost of moving the ore from the lake to Pittsburgh is about $.26 a ton for the Bessemer & Lake Erie; $.28 for the New York Central lines; $.31 for the Pennsylvania lines; $.35 on the Wabash, and $.38 on the Baltimore & Ohio. He said that very little lake ore is shipped to Bethlehem, and that "no sane man would ever build a steel plant at Bethlehem upon the basis of receiving his ore from Lake Superior." Hence, the ore freight rate to Bethlehem is not important. The senator complained particularly of the rate to Wheeling from Cleveland, a distance of 160 miles, which is $.0037 per ton per mile, while the rate from Ashtabula to Pittsburgh is $.0075 per ton per mile. "Wheeling," said the senator, "is a very serious competitor because it has pretty much all the advantages that we have as to fuel, with the exception of coke." When asked whether he had included anything for interest on investment, or for wear and tear, in his estimate of cost of operating, the senator replied, "I presume not, I am not familiar with railroad bookkeeping." As to the $.26 allowance made to the terminal railroad of the Carnegie Steel Co., the senator said that a manufacturing concern which relieves a railroad of part of its work should be compensated to that extent. The following interesting colloquy took place between the chairman, Mr. Stanley, and Senator Oliver:

The Chairman.—Had Mr. Carnegie retained control of the Carnegie plants with the control of that railroad and with the control of at least a fair condition of rates over the Duluth, Missabe & Northern and the Great Northern lines, transporting freight to the lakes, and had he his own shipping facilities across these lakes, is there any other company outside of Pittsburgh that could, under severe competition, have lived against him for any considerable length of time?

Senator Oliver.—Not unless the railroads should come down in their rates. That is what I want them to do now.

The Chairman.—Mr. Carnegie, in 1901, with the transportation question settled, was the master of the iron situation of this continent.

Senator Oliver.—I do not like to inject something that may have nothing to do with the question, but I rather think that Mr. Carnegie depended for at least a part of his prosperity upon undue favors from the transportation companies.

The Chairman.—Was there any other way by which they could wrench free Carnegie's hold upon the steel business, his secret rates, his ownership of that road and his natural facilities, except by paying him his own price to quit the business?

Senator Oliver.—It would be a mere expression of opinion and I have not formulated a direct opinion upon the subject.

Senator Oliver said that he did not think that Mr. Carnegie had any greater appreciation of the possibilities of Pittsburgh in the early days than quite a number of other men, but he had more courage than some of them, and was fortunate in accumulating more capital early. He had assistants who were unequaled in their various lines and consequently did more for the line of great manufacturing in Pittsburgh than anybody else.

Advance Copper Prices

A leading Connecticut producer of brass and copper materials advanced prices as follows, effective Dec. 11: Drawn copper rods, bars and strips, ¼c; copper in rolls, ¼c; sheet copper, 1c; copper anodes, ¾c; bars and insulated copper wire, also magnet wire, ¼c.

Hall furnace of the Republic Iron & Steel Co., at Sharon, Pa., has been blown out.

PROHIBITIVE TARIFFS

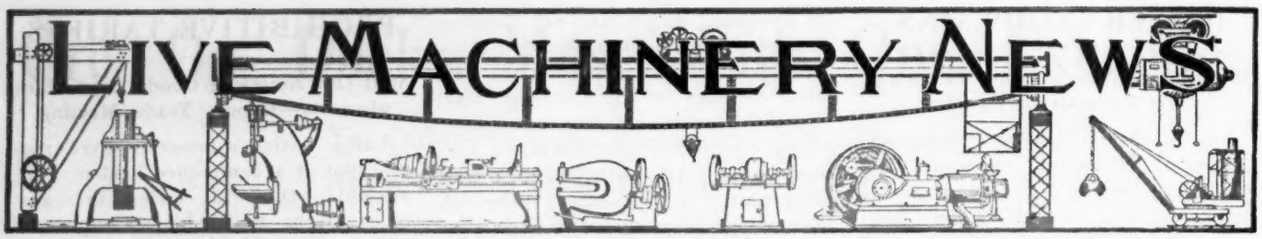
Shut Out American Goods, Says Manufacturer—Export Trade Meeting.

Large business interests were represented at a conference held in Philadelphia, Dec. 13, under the auspices of the Philadelphia Commercial Museum, to consider the various features of export trade. C. N. Shipley, of Cincinnati, declared that the combined manufacturers of the United States should take measures to cause prohibitive tariffs in other countries to be reduced. Such conditions, he said, shut out American goods at a profit. He recommended that a committee be appointed to take up the matter with the government authorities. John Barrett, director of Pan-American Union, said that the whole success of the Panama canal depended upon the matter of tolls that are charged upon American shipping and the shipping of the world. "I believe that all coastwise ships should go through the canal practically free. I do not believe that this violates any international agreement. Our laws limit the coastwise trade to vessels carrying the American flag, and so this privilege to American ships would not be discriminatory. Immediate action is necessary. The tolls must be determined at this session of congress. Otherwise it would be a physical impossibility to get ships ready for the trade." Addresses on various topics were made by other manufacturers and importing interests. One of the leading questions discussed was the relation between the manufacturer and the exporter.

Canadian Outputs.—The output of the Dominion Steel Co., for November, was as follows in tons: Pig iron, 22,916; steel ingots, 27,084; blooms, 23,633; rails, 7,527; rods, 8,325; shipments, 19,923. The output of the Nova Scotia Steel & Coal Co., for November, was as follows in tons: Coal, 77,587; pig iron, 7,170; steel ingots, 7,423; billets, 7,694, and bars and plates, 5,702.

The Sharon Foundry Co., Sharon, Pa., has sent out in accordance with its custom, a beautiful calendar, which, as in past years, is the reproduction of a famous painting. The painting this year is "The Little Sister," by Arthur J. Elsley, who has become famous as a painter of scenes of childhood.

The Sloss-Sheffield Steel & Iron Co. has declared the regular quarterly dividend of 1¾ per cent on preferred stock, payable Jan. 2.



In New York, it is reported that the Delaware & Hudson Railroad Co. is preparing to ask for bids on the entire equipment for its Watervliet, N. Y. shops about Jan. 1. It is expected that the tools and equipment to be inquired for will have an aggregate value of between $100,000 and $150,000. It is also reported in that market that the Delaware, Lackawanna & Western is to ask for bids on 20 large machines for installation at its Scranton, Pa., shops. The total amount of current business in New York, however, is becoming smaller with the approach of the holidays. In Pittsburgh, it is expected that bids on a moderate quantity of new work will be asked for within the next 30 to 60 days. A fair total of small orders has been placed by railroad companies in that district lately, but the business from that source is considered as being by no means satisfactory. The Westinghouse companies have booked considerable business for the first quarter. In Cleveland, a small manufacturing concern which recently moved into a new plant has purchased about $10,000 worth of machine tools and other equipment. The Cleveland market, however, is quite featureless in most lines. In the western and southern markets, power and power transmission equipment is the most active line; the railroads continue to restrict their purchases in the machinery field. In Kentucky and Tennessee, demand is also active for mining machinery.

Water Works

Plans are being prepared by Architect T. H. Scott, Pittsburgh, for a brick and steel pumping station for the city of Pittsburgh, to cost $200,000.

The Pittsburgh Crucible Steel Co. is taking bids for the installation of two triplex pumps with a capacity of 15,000,000 gallons per day, electrically driven, at Midland, Pa.

Oscar Claussen, St. Paul, is consulting engineer for the new water works to be constructed by the village of Fox Lake, Wis. Bonds in the sum of $20,000 have recently been issued to finance the project.

The city of Santa Barbara, Cal., has sold its bond issue of $40,000, to be used for extensions in its waterworks, to the state of California, and will commence the proposed improvement in the immediate future.

Machine Tools

The American Multigraph Sales Co., Cleveland, is in the market for lathes, milling machines, shapers, etc.

The Farrel Foundry & Machine Co., Ansonia, Conn., is inquiring for several large machine tools, aggregating in cost about $14,000.

The American Multigraph Sales Co., Cleveland, is purchasing additional machinery equipment, including milling machines, shapers, lathes, etc.

George Armitage, R. F. D. No. 2, Box 154, Pasadena, Cal., will build a machine shop on East Ninth street, Los Angeles, A permit for the erection of the plant has been issued.

The Henry L. Koehler Mfg. Co., Louisville, is equipping a plant at 431 South Center street, that city, for the manufacture of brass dies and other similar work. Milling machines, lathes, etc., are being installed.

A machine shop is being equipped at Hattiesburg, Miss., by the Southern Automobile & Machine Co., which has been incorporated with $50,000 capital stock. R. R. Boykin is manager of the company.

The board of school trustees, Alhambra, Cal., has instructed its clerk, I. W. Barnett, to purchase a lathe, grinder head, band saw and table saw for the manual training department of the schools. The appropriation for the items is $1,350.

The Blake Specialty Co., Rock Island, Ill., is erecting a new plant, including a foundry, 80 x 100 feet, with a core room and cupola room, each 20 x 30 feet, and a cleaning room, 30 x 45 feet; a machine shop, 80 x 75 feet, and a heating plant and pumping station, 30 x 45 feet. A large amount of new equipment will be needed, especially motors, molding machines, one milling machine, an engine lathe and other machine tools.

The most important piece of news for the week concerning new business for New York Machine tool dealers, is that the Delaware & Hudson Railroad Co. will ask for bids on the entire machine shop equipment for the Watervliet plant, about Jan. 1. The buildings are expected to be completed early next spring, and the machinery requirements to be provided for will mean the distribution of from $100,000 to $150,000 in orders. It is also said that the Delaware, Lackawanna & Western railroad will send out specifications on 20 large machines for the Scranton shops about the same time. The aggregate cost of these will be in the neighborhood of $50,000. Consideration is being given shop equipment by several other railroad corporations, including the Southern railway, the Pennsylvania and the New York Central, and it is believed that something definite concerning these requirements will develop early in 1912.

Power Plant Equipment

Galva, La., has voted in favor of the issuance of bonds for the installation of an electric lighting plant.

The citizens of Royersford, Pa., recently voted in favor of a loan of $30,000 to erect an electric light plant.

The city council, La Salle, Ill., will soon receive bids for 122 arc lamps and two generators.

Plans have been prepared by Welsh, Sturtevant & Poggi, Wilkesbarre, Pa., for a new central heating plant for the Pennsylvania state sanitarium, Cresson, Pa.

The water commission, Fond du Lac, Wis., is planning to install equipment and machinery in the water station to generate current for lighting purposes.

Plans have been completed by Alexander Bros., Cadiz, Ky., for the erection of an electric light plant. Water power will be used in the operation of the plant.

The Nebraska Transportation Co., Omaha, Neb., will soon commence work on a new steam power plant at Elk City, having a capacity of 21,000 horsepower.

The power plant of the Karges

Wagon Works, Evansville, Ind., was recently damaged by fire to the extent of $3,000. New machinery will be purchased immediately.

The board of public works, Anderson, Ind., will receive bids until Jan. 2, for a new 1,000-kilowatt, turbo-generator to be installed in the municipal electric light plant.

D. A. Reed, engineer, Aurora, Minn., is promoting the construction of a hydro-electric plant on the St. Louis river, for the purpose of transmitting power to the various cities on the range.

The Sisterville Electric Light & Power Co., Sisterville, W. Va., is enlarging its power plant and has awarded a contract to John Rea for structural work. Contracts for equipment have not been placed.

The Pigeon River Milling Co., Ontario, Ind., is preparing to establish a hydro-electric plant to furnish electricity to a number of cities in the locality. The concrete dam, 600 feet in length, will be improved and a power house built.

The city council, Stanton, Neb., has decided to build an addition to the present power house and to purchase a 100-horsepower steam engine and a 125-horsepower steam boiler, the machinery to be installed as soon as possible.

The stockholders of the Weymouth Light & Power Co., Weymouth, Mass., have voted in favor of appropriating $60,000, for making extensive improvements, to include the installation of a new turbine and condenser, as well as of a boiler.

The board of regents, University of Michigan, has rejected all bids for the construction of the proposed power house at Ann Arbor, Mich. Smith, Hinchman & Grylls, Detroit, prepared the plans. New plans are to be drawn.

The Cambria Steel Co., Johnstown, Pa., is constructing a large addition to its electrical power department, which is located between Nos. 5 and 6 blast furnaces and the Pennsylvania railroad. Some orders for equipment have been placed.

The Twentieth Century Transportation Co., Winona, Minn., plans to build a power house at Lancaster, Wis., in the spring, to furnish current for its interurban electric railroad. Ernest Norwood, Lancaster, is general manager.

The Clifton Light & Power Co., Prescott, Wis., controlled by B. W. Utman, Hudson, Wis., is planning the reconstruction of its hydro-electric plant on the Kinnikinnick river. It is planned to install a 200-kilowatt, hydro-electric unit and to build a dam further up stream so as to obtain a head of 70 feet.

New Construction

The Lloyd Mfg. Co., Menominee, Mich., advises that it is not yet ready to give out any information regarding its new plant.

Cretsinger Bros., Los Angeles, Cal., have been granted permission by the city council to erect a boat building and repair plant at San Pedro Harbor.

The John Boyle Co., Baltimore, has awarded contracts for the construction of a four-story can factory, 44 x 192 feet.

The Detroit Steel Products Co., Detroit, has taken out a permit for the erection of a brick and steel factory building, to cost approximately $6,000.

The Nashville industrial bureau, Nashville, Tenn., reports that W. J. Miles Jr., Ohio, is planning the establishment of a malleable iron foundry in that city.

The Danville Plow Works, owned by R. C. Sides, Danville, Va., is having plans drawn for the erection of an additional foundry department for the manufacture of a full line of stoves.

It is announced that the Pittsburgh Motor Car Co. has finally selected a site at Brushton, a suburb of Pittsburgh, for its proposed new plant.

F. E. King is organizing a company at Norfolk, Va., for the manufacture of blow-pipes. The plant will be erected early in 1912, according to present plans.

The American Forge Co., 109 Mission street, San Francisco, will build an addition to its plant. Contract for construction has been awarded to W. H. Reed, San Francisco.

The Chase Rolling Mill Co., Waterbury, Conn., advises that it is erecting a new rolling mill, 120 x 300 feet, at Waterville, Conn., which is intended to provide for extensions.

The A. L. Swett Iron Works, Medina, N. Y., advises that it will build a large new foundry sometime next year. Plans for the same have not yet been completed, however.

The Stuyvesant Motor Car Co., Cleveland, has absorbed the Grant-Lees Machine Co., that city, automobiles to be manufactured. A new four-story building, 120 x 120 feet, is being erected.

The Tucson Iron Works, Tucson, Ariz., has been awarded a contract for the iron work for the new smelting plant to be erected by the American Smelting & Refining Co., at Hayden, Ariz.

The Webster Mfg. Co., 343 South Dearborn street, Chicago, expects to commence work soon on a new foundry. The building will be of brick and mill construction. Full details have not yet been decided.

A building permit has been granted to the Erie Forge Co., Erie, Pa., for an addition to the present machine shop, 60 x 100 feet, to cost about $10,000. The company will also erect a pattern shop 20 x 87 feet.

Kenova, W. Va., is being considered by E. W. Sample and others as a location for a proposed foundry which it is intended to erect at a cost of $50,000. The Kenova commercial club has the matter in charge.

Equipment is being purchased by the DeBats Crucible Steel Co., for the new plant to be erected near Washington, Pa. A contract for the erection of three steel buildings likely will be awarded within the next week.

The Wire Goods Co., Worcester, Mass., has bought seven acres located near Burhens Crossing, on the Boston & Maine railroad, and will improve the property with an extensive plant for the manufacture of wire goods.

The National Radiator Co., Johnstown, Pa., has let a contract for the construction of additions to the foundry and core room of its Trenton, N. J., plant. The additions will cost approximately $10,000.

Curtiss-Shea-Cox, Inc., Los Angeles, Cal., are planning to erect a plant for the manufacture of automobiles, but advise that they are not yet ready to make an announcement as to the details.

The Arizona Eastern Railway Co., Phoenix, Ariz., is said to be preparing plans for a new roundhouse to be erected near Winkelman, Ariz. W. H. Wheeler, Phoenix, is architect for the company, which is operated by the Southern Pacific railroad.

The Fremont Furnace Co., Fremont, O., advises that the increased demand for its product necessitates the enlargement of its plant. This will be done as soon as the necessary plans and specifications can be completed.

The Republic Motor Car Co., Hamilton, O., is erecting two buildings, 60 x 300 feet and 80 x 140 feet, respectively, both of mill construction. The company is not yet in a position to state its requirements in the way of machinery and equipment as specifications have not yet been prepared.

Jacob Hansen, 5416 West North avenue, Chicago, is taking bids on a

new wood-working plant and pattern shop on which construction work will commence at an early date. The shop will be two stories, 50 x 112 feet, and will be electric driven throughout.

Following the almost complete destruction of the plant of the New Jersey Adamant Works, in East Newark, by fire, Dec. 13, the directors met and discussed plans for rebuilding at once. The loss amounted to about $75,000, including considerable machinery.

The Massillon Bridge & Structural Co., Massillon, O., is erecting a new shop, 156 x 400 feet. It will be equipped with traveling cranes and will be equipped to handle about 1,000 tons of finished material per month. Highway and railroad bridges, as well as steel buildings, will be fabricated.

The Fellows Boat Works, San Diego, Cal., will build a boat building and repair plant on Hawthorne street. The plant will be used for the construction of small craft, such as yachts and launches, and will be fully equipped for such work. F. C. Spaulding is president, and Emil Aarup, manager of the company.

The chamber of commerce of Burlington, N. J., has received proposals from two large manufacturing concerns, for inducements to locate plants at Burlington. One of the interested parties is a manufacturer of fire-arms, and the other is a hat factory. Elmer E. Anderson is president of the chamber of commerce.

John C. Graham, Butler, Pa., has purchased the plant of the Roberts Boiler & Tank Co., Queen Junction, Pa. The plant consists of a steel building, 60 x 90 feet, and a smaller building, 20 x 80 feet. It is understood that Mr. Graham has made a proposition to move the plant to Butler, Pa., providing the chamber of commerce of that city will secure a site.

The Illinois Malleable Iron Co., Chicago, has just completed a new annealing room, 118 x 145 feet, and will erect six more annealing furnaces, thus giving the company a capacity for annealing 450 tons a week. The concern has also made an addition to its malleable foundry, 67 x 128 feet, which, when completed, will give employment to 260 molders. L. W. Lukens is superintendent of this department.

At a meeting of the board of directors of the Baldwin Locomotive Works, Dec. 15, the question of completing the extensive enlargement to the plant at Eddystone, Pa., was favorably acted on. The specifications for a large amount of machine tools, and a number of electric traveling cranes will be taken up for consideration shortly. The foundation for the new structure is ready for above-ground construction work, and it is said that the latter can be completed within four months.

Miscellaneous

M. J. Moss, Pineville, Ky., is organizing a company for the purpose of developing coal lands in the vicinity of Whitesburg, Letcher county, Ky. Openings are to be made in the immediate future.

The Sligh Furniture Co., Grand Rapids, Mich., has acquired timber properties near Klamath Falls, Ore., and is said to be planning for the erection of a lumber plant, including saw and planing mills.

Chester & Fleming, engineers, Pittsburgh, have received bids for a 20,000,000-gallon, vertical, triple expansion pumping engine for the Erie, Pa., water works. The Bethlehem Steel Co. is the low bidder, its bid being $102,000.

The Kentucky Southwestern Traction, Light & Power Co., which plans the construction of a line from Uniontown, to Hickman, Ky., will let contracts for equipment about April 1, 1912, it is reported. E. F. Wheaton, Indianapolis, Ind., is general manager of the company.

Bids are being taken by the Cross Coal Co. for buildings, machinery and equipment to be used in the development of 1,700 acres of land near Burgettstown, Pa. Present plans include a power plant with an initial capacity of 900 horsepower and the mine will be operated with electric power at a capacity of 3,000 tons daily. Smith & Lewis, Pittsburgh, are preparing plans for the plant. The company was incorporated recently with a capital stock of $200,000.

Government News

Bids for proposals were opened by the bureau of supplies and accounts in the navy department, for furnishing materials and supplies in accordance with the schedules enumerated, for delivery at various stations, as follows:

Schedule 4701, class 1, Mare Island, one 20-ton 4-motor electric traveling crane, with 5-ton auxiliary hoist: Cleveland Crane & Engineering Works, Wickliffe, O., $6,625 and $6,385; Monarch Engineering Co., Baltimore, $7,735; Morgan Engineering Co., Alliance, O., $7,175; Northern Engineering Works, Detroit, $6,685; Niles-Bement-Pond Co., New York, $7,205; Pawling & Harnischfeger, Milwaukee, $6,200; Toledo Bridge & Crane Co., Toledo, $6,400; Whiting Foundry & Equipment Co., Harvey, Ill., $5,895, and Cyclops Iron Works, San Francisco, $5,200.

Schedule 4072, class 11, Puget Sound, one electric motor truck, 1,000 pounds capacity: F. A. Branda & Co., New York, $2,552.50, $3,051.25, $2,683.75; General Vehicle Co., Long Island City, $2,750; Kentucky Wagon Co., Louisville, $2,410, $2,308, $2,108; United Supply & Equipment Co., Washington, $2,838; Washington Motor Vehicle Co., Washington, $1,945, $2,110, $2,095, $2,490, $2,260, $2,340; Waverly Co., Indianapolis, $2,380.

Schedule 4073, class 21, Puget Sound, two furnaces, oil-burning, crucible, portable, closed, flame tight: Monarch Engineering Co., Baltimore, $324.50, $359; Mirc's Oil Equipment Co., Norfolk, $345, $390; W. S. Rockwell Co., New York, $280.

Schedule 4082, class 51, Pearl Harbor, Hawaii, one handpower traveling crane, 15-ton: Brown Hoisting Machinery Co., Cleveland, $4,835; Hoisting Machinery Co., New York, $1,671; Morgan Engineering Co., Alliance, O., $2,695; Northern Engineering Works, Detroit, $1,890; Niles-Bement-Pond, New York, $2,100, and Whiting Foundry & Equipment Co., Harvey, Ill., $1,787.

Schedule 4083, class 61, Charleston, one surface condenser: Elberger Condenser Co., New York, $1,573; M. T. Davidson & Co., Boston, $1,900; Trustees Platt Iron Works, Dayton, O., $1,496; Wheeling Condenser Co., Carteret, N. J., $2,255; C. H. Wheeler Mfg. Co., Philadelphia, $1,786, and Williamson Brothers & Co., Philadelphia, $1,820.

Schedule 4084, class 62, Brooklyn, 8 transformers: General Electric Co., Schenectady, N. Y., $245 each; F. Lowenstein, New York, $4,400 total; Marconi Wireless Tel. Co., New York, $2,000 part; Wireless Specialty Co., New York, $235 each.

Schedule 4102, class 71, Brooklyn, one car puller: C. W. Hunt Co., West New Brighton, N. Y., $630; Lenher Engineering Co., New York, $1,025; Lidger Mfg. Co., New York, $1,071, $981, $901, $501; J. H. Strohmeyer & Co., Philadelphia, $480; Whiting Foundry & Equipment Co., Harvey, Ill., $1,190; Weller Mfg. Co., Chicago, $602, and Williamson Bros. & Co., Philadelphia, $560.

Schedule 4103, class 81, Portsmouth, one universal milling machine, motor driven: Brown & Sharpe Mfg. Co., Providence, R. I., $1,904.63, $1,843.13; Becker Milling Machinery Co., Hyde Park, Mass., $1,859.32; Frevert Machinery Co., New York, $1,601.34; Morgan Engineering Co., Alliance, O., $1,458.45; Niles-Bement-Pond Co., New York, $1,629.85; Prentiss Tool Supply Co.

Schedule 4105, Class 91, Brooklyn, one flatwork ironer 54-inch single roll steam heated, ½-horsepower motor; one dry room, two loop, driven by one horsepower motor: American Laundry Machinery Co., New York, $1,097; Fairbanks Co., Washington, $1,675.84; Troy Laundry Machinery Co., New York, $1,320.

Contracts have been awarded by the isthmian canal commission for furnishing, in accordance with bids described as follows, plant and materials for a hydro-electric plant at Gatun; opening of Oct. 24:

Class 1, item 1, 3 water turbines; item 2, three governors; item 3, three head gates; item 4, three penstocks; item 5, three compressed air regulators and piping; item 6, a lubricating system: Pelton Water Wheel Co., New York, (total excepting item 6) $92,850.

Class 2, 3 generators, 3 excitors, 2 motor-driven excitor sets: General Electric Co., $42,067.

Class 3, one 20-ton 3-motor traveling crane: Niles-Bement-Pond Co., New York, $4,310.

A contract for furnishing miscellaneous saw machinery, etc., under schedule 4004, class 11, for delivery at Philadelphia, has been awarded to the J. A. Fay & Egan Co., Cincinnati, by the bureau of supplies and accounts, navy department, at $765.75.

The isthmian canal commission will receive bids to be opened Dec. 26, for furnishing one air compressor, motor-driven, in accordance with specifications.

(In order to assist the post office in delivering letters to new concerns, it is suggested that the names of incorporators be written in the lower left hand part of every envelope addressed to such new companies.)

New Buyers

The following manufacturing companies have filed articles of incorporation:

The St. Louis Plow Co., St. Louis; $175,000; by G. H. Vineyard, H. S. Swanson, William Kelley and others.

The Universal Nut & Bolt Lock Co., Newport, Ky.; $50,000; by George B. Martin, E. F. Brock and E. Elston.

The Stafford Heating & Sheet Metal Co., Ashtabula, O.; $10,000; by F. T. Walton.

The Wheelock-Hammond Heating Co., Birmingham, Ala.; $5,000; to manufacture hot air furnaces; by president, Charles F. Wheelock.

The Globe Mfg. Co., Phoenix, Ariz.; $500,000; to manufacture plumbers' tools, projectiles, etc.; by Vernon L. Clark and W. H. Teasley.

The Electric Wind Turbine Co., Rochester, N. Y.; $150,000; to manufacture electric machinery, etc.; by J. G. Childs, B. G. Tallman, etc.

The Akin Steel Tire & Mfg. Co.; Sumner, Mo.; $300,000; by J. H. Akin, j. D. Stoner, C. M. Hooper and others.

The Compound Cycle Engine Co., New York; $30,000; to manufacture engines, etc.; by R. W. France, Brooklyn; C. J. Kulberg, J. P. Thorne.

The Empire Gear & Mfg. Co., Indianapolis; $20,000; by directors, F. S. Clark, C. H. Hurd, H. M. Talbot and A. H. Off.

The Long Silent Motor Co., Hannibal, Mo.; $12,000; by Elmer C. Long, Frank R. Tate and Theodore Moreno.

The Chandler Comb Machine Co., Ayer, Mass.; $50,000; to manufacture comb machinery; by R. L. Chandler, E. W. Carley and J. Q. Edgerly.

The Quincy Casting Co., Quincy, Ill.; $10,000; to manufacture castings for stoves, ranges, furnaces, etc.; by Chas. Schnellbacher, Willis Geo. Beals.

The Boston Filter Co. of Philadelphia, Camden, N. J.; $35,000; to manufacture filters; by Henry B. Russell, Philadelphia; May Russell, Philadelphia; Jos. C. Haines, Camden, N. J.

The Fossee Novelty Co., Louisville, Ky.; $25,000; to manufacture electrical mechanical devices; by Lewis Fossee, E. A. Ryans, Clarence B. Mullen and others.

The Potter Mfg. Co., Ashtabula, O.; $25,000; to manufacture garden tools; by W. A. Potter, C. J. Chamberlain, A. M. Ford, A. W. Chamberlain and John Hasenpflug.

The Trow & Holden Co., Barre, Vt.; $100,000; to manufacture stone-working machinery and supplies; by W. M. Holden, E. T. Tobin, Ira C. Lawrence.

The Superior Tool Co., Wheeling, W. Va.; $50,000; by Ed. W. Westwood, H. E. Rennard, Joseph H. Reass Jr., E. F. Schofield and William E. Krupp.

The Samuel G. Rogers & Co., Buffalo, N. Y.; $50,000; to manufacture hardware supplies, etc.; Oliver Cabana Jr., Martin J. Cabana, E. G. Mansfield, all of Buffalo, N. Y.

The Flexo-Motor Co., Springfield, Ill.; $30,000; to manufacture mine motors, supplies, etc.; by Fred C. Miller, William Wishart, Otto Butzke.

The Lombard Mfg. Co., Rochester, N. Y.; $30,000; to manufacture engine starters, mechanical devices, etc.; by J. C. Lombard, P. W. Hodgkinson and S. C. Ward.

The Cincinnati Precision Lathe Co., Cincinnati, O.; $50,000; to manufacture small lathes. adjustable reamers, milling machines, etc.; by M. H. Stewart, W. C. Tatman, J. M. Tatman.

The Excelsior Coupler & Tool Co., Newark, N. J.; $50,000; to manufacture car couplers, tools, etc.; by Albert A. Moss, 53 Wallace street; Wilfred C. Roszel, 164 Market street; Walter R. Coe, 164 Market street, all of Newark, N. J.

The American Welded Chain & Ring Co., New Brunswick, N. J.; $125,000; to manufacture welded wire chains, rings, castings, forgings, etc.; by Chas. L. Thatcher Jr., Jos. E. Alexander, 2 Rector street, New York City; Wm. E. Sperling, 133 Livingston avenue, New Brunswick, N. J.

The International Gas Engine Co., Harrison, N. J.; $100,000; to manufacture engines, machines, dynamos, motors, etc.; by Edw. F. Paulu, 38 East Seventeenth street, East Orange, N. J.; Geo. R. Townsend, 11 Carnegie avenue, East Orange, N. J.; E. Milton Souza, 351 West 114th street, New York.

General Industrial

Sykes Steel Roofing Co., Chicago, has changed its name to Sykes Co.

The Henry Motor Car Co., Muskegon, Mich., has been declared bankrupt. Its affairs are being handled by Kirk E. Wicks as referee.

It is authoritatively denied that the American Locomotive Co. will move its plant from Schenectady, N. Y., to Rome, N. Y., as recently rumored.

A strike of core makers at the plant of the Aluminum Castings Co., Detroit, has been settled by the voluntary return of the strikers. It was in effect only a few days.

The Pontiac Power Co., Pontiac, Mich., which recently acquired the Rapid Motor Vehicle Co. power plant, has been authorized to expend $36,000 in improvements.

The addition to the plant of the Page-Hersey Iron Tube & Lead Works, Welland, Ont., constructed at a cost of $1,000,000, was opened last week, necessitating an addition to the force of 100 hands.

R. A. Reed has been appointed temporary receiver for the Pittsburgh Automatic Air Pump Co. A receiver was appointed upon application of the Brown & Zortman Machine Co., Pittsburgh.

At the annual meeting of the Thompson-Starrett Co., E. L. Marston was elected a director to succeed W. S. Dinwiddie, and Robert Olyphant to succeed Charles D. Freeman. All of the other directors were re-elected.

The United States Steel & Iron Co., San Jacinto City, Tex., has awarded a contract to George J. Hagan, Pittsburgh, for two rail and two fagot heating furnaces to be used in a plant for re-rolling old rails and making merchant bars.

The Stimson Scale & Electric Co.,

Northville, Mich., has been incorporated for $50,000. It will succeed to the business of the Stimson Scale Co., which failed about a year ago, creditors having recently accepted terms offered under a reorganization plan.

The Fox Mfg. Co., Brooklyn, Wis., has been purchased by R. J. Neckerman, of Madison, Wis., who will continue the business of manufacturing and jobbing specialties under the name of Fox Supply Co. F. W. Campion has been appointed general manager.

The Galena Iron Works Co., Galena, Ill., has been awarded the contract for rebuilding the plant of the Joplin Separating Co., which was recently destroyed by fire. The new plant will have four magnetic separators, one mechanically revolving kiln, and one brick hand kiln.

The Lewis Electric Welding & Mfg. Co., Toledo, O., advises that while the damage of its recent fire was considerable, no interruption to business will be necessitated, and all deliveries will be made without any material delay. The plant was in no way crippled.

The Waverly Mfg. Co., Jefferson, Wis., has increased its capital stock from $50,000 to $52,500. The plant recently was moved from Cambridge, Wis., to Jefferson, and consolidated with the Waverly Motor Co., of Milwaukee. The new factory will be ready for operations in about two weeks.

H. B. Hollins, Walter Kutzleb and A. W. Kenworthy have been elected directors of the International Steam Pump Co., to fill vacancies. For the eight months ending Sept. 30, net profits from combined operations of associated companies were $2,676,449, total interest and dividends $2,169,876, leaving a surplus of $506,573.

The Lambertville Iron & Steel Co., Lambertville, Pa., has been incorporated under the laws of the state of Pennsylvania, and has taken over the plant of the Coombe & Massey foundry, of Philadelphia. Those in charge of the plant under the new organization are John E. Massey, of Lambertville, and Frank Gould, former superintendent of the Trenton Malleable Iron Co.

The John A. Roebling's Sons Co., Trenton, N. J., manufacturers of iron, steel and copper wire rope and wire, advises that its recent fire was confined to the flat wire department, but that the work of this section of the factory can be carried on in other parts of the plant, and no interruption to business will be necessitated. The burned shop will be immediately rebuilt.

The Beatrice Steel Tank Co., Beatrice, Neb., advises that it will manufacture a complete line of steel tanks and sheet metal goods. The equipment is being installed, and operations will be begun about the first of the year. The officers of the company are: President, Thomas E. Adams; secretary and treasurer, C. S. Warren, and superintendent, J. F. Hoag.

The Kewanee Boiler Co., Kewanee, Ill., advises that it recently increased its capital stock mainly for the purpose of capitalizing a surplus that it has accumulated in the past few years. A small part of it, however, will be used to increase the working capital. No large additions to the factory or equipment will be made at the present time, as approximately $300,000 were expended toward this end last year.

The Griffith Mfg. & Supply Co., Griffith, Ind., advises that it will take up the business of B. B. Potter, of that city, and that it has a plant fully equipped to manufacture gray iron, aluminum, bronze, and brass castings, and for doing all sorts of pattern and machine work. A new warehouse and coal shed, 75 feet long, will be built and a switch added to the factory. A band saw will also be added in the spring.

The J. Q. Clark Tank Co., Crawfordsville, Ind., the incorporation of which was recently noted, advises that it will manufacture fountains, troughs, feed cookers, bins and tanks of all kinds, and that it is building a factory building, 60 x 100 feet, with both a steam and an electric line switch. The officers of the company are: President, J. G. Rush; vice president, H. S. Binford; secretary, J. H. Elder; and treasurer and manager, J. Q. Clark.

A committee to act as a protective committee for bondholders of Allis-Chalmers Co. sinking fund 5s in whatever re-organization may be undertaken, has been selected including James N. Wallace, chairman, R. W. Leigh, C. W. Cox, F. Vogel Jr. and J. S. McClement, with F. L. Babcock as secretary. The Central Trust Co. will act as depository and Guthrie, Bangs & Van Sindern as counsel. Immediate deposit of bonds is urged since action along the line of reorganization must be accomplished by the opening of the new year.

The Gealy Wrench & Mfg. Co., Grove City, Pa., advises that it was recently incorporated to take over the Gealy Wrench Co. of that place, and that it will continue to manufacture the "Gealy" pipe and chain wrenches. It is probable that the present buildings will be enlarged and new equipment installed in the spring. The officers of the company are: President and general manager, G. M. Gealy; vice president and superintendeent, U. S. Cope; secretary, A. S. White, and treasurer, I. C. Black.

Trade Notes

The International Oxygen Co. announces the change of its address from 68 Nassau street to 115 Broadway, New York City.

The office of the Chas. Dreifus Co., Phladelphia, iron and steel scrap, has been removed from suite 501 to 508 in the Pennsylvania building.

The Debevoise-Anderson Co., 95 Liberty street, New York City, has been appointed agent for the sale of Jamison selected 72-hour foundry coke in the state of New Jersey.

The Lackawanna Steel Co. will open, Jan. 1, a sales office in the Philadelphia district, quarters having been secured in the Morris building, Philadelphia. The office will be in charge of William Breeden, formerly connected with the Philadelphia office of the Carnegie Steel Co.

John N. Allen, formerly purchasing agent of the Lackawanna Steel Co., with headquarters at Buffalo, N. Y., has opened an office at 738 Oliver building, Pittsburgh, Pa., and will act as sales agent for a line of supplies, material and patents used in steel works.

The Adams-Bagnall Electric Co., Cleveland, has opened an office in Boston with E. R. Bryant, who has been connected with the company's New York office, in charge. J. G. Pomeroy, formerly western sales manager, has been made sales manager of the company with headquarters in Cleveland. C. L. Eshleman has been appointed publicity manager with headquarters also in Cleveland.

Fires

Fire recently damaged the plant of the City Iron Foundry, Lawrence, Mass., to the extent of $12,000.

The plant of Cann & Saul, 49 Market street, Hartford, Conn., manufacturers of steel castings and high speed drills, was recently damaged to the extent of $15,000 by fire.